AECOM Environment

Submitted to:
Consolidated Edison Company of NY
Astoria, New York

Submitted by:
AECOM
Westford, MA
60155456.312
December 2010

Alternatives Analysis Report

Former East 17th Street Station
(NYSDEC Site # V00541)
New York, New York
Voluntary Cleanup Agreement (VCA) Index D2-0003-02-08

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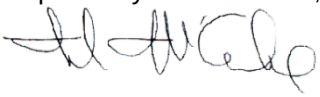
Prepared By Mike Gardner, Senior Engineer



Prepared By Mark M. McCabe, Project Manager

Reviewed By Aimee Fitzpatrick, PE

CERTIFICATION

I, Aimee Fitzpatrick, certify that I am currently a NYS registered professional engineer as defined in 6 NYCRR Part 375 and that this report was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications.

Aimee Fitzpatrick

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December 8, 2010
Date

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List of Acronyms

AAR	Alternatives Analysis Report
AWQSGVs	Ambient Water Quality Standards or Guidance Values
BEEI	Bureau of Environmental Exposure Investigation
bgs	Below ground surface
BTEX	Benzene, toluene, ethylbenzene, and xylene
Con Edison	Consolidated Edison Company of New York, Inc.
DER-10	Technical Guidance for Site Investigation and Remediation
DNAPL	Dense non-aqueous phase liquid
ENSR	ENSR Corporation
ft	Feet
HASP	Health and Safety Plan
ISCO	*In situ* chemical oxidation
ISMP	Interim Site Management Plan
ISS	*In situ* solidification
LNAPL	Light non-aqueous phase liquid
MGP	Manufactured Gas Plant
NAPL	Non-aqueous phase liquid
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OLM	Oil-like material
PAHs	Polycyclic aromatic hydrocarbons
RAOs	Remedial Action Objectives
ROW	Right-of-Way
RAWP	Remedial Action Work Plan
RETEC	The RETEC Group, Inc.
RI	Remedial Investigation (RI)
RIR	Remedial Investigation Report
RRUSCOs	Restricted Residential Use Soil Cleanup Objectives
RIR	Remedial Investigation Report
RRUSCOs	Restricted Residential Use Soil Cleanup Objectives
SCS	Site Characterization Study
SMP	Finalized Site Management Plan
SVOCs	Semivolatile Organic Compounds
TLM	Tar-like material

TOGs	Technical and Operations Guidance Series
VCA	Voluntary Cleanup Agreement
VOCs	Volatile Organic Compounds

Executive Summary

The East 17th Street Station site is located in the borough of Manhattan in New York City, New York County, New York. The former site occupied the majority of the block between Avenue B/Avenue C and East 14th Street/East 15th Street, in an area that is currently part of the Stuyvesant Town residential apartment complex. Consolidated Edison Company of New York, Inc. (Con Edison) is managing the former MGP site in accordance with Voluntary Cleanup Agreement (VCA) Index D2-0003-02-08 as negotiated with the New York State Department of Environmental Conservation (NYSDEC).

This Alternatives Analysis Report (AAR) presents the results of the remedial alternative selection process for the site. Con Edison has conducted a series of investigations at the site since 2001 to characterize the potential impacts of MGP residuals at the site, resulting in the following findings:

- Surface Soil – Based on historical site information and other physical evidence, e.g., lack of demolition debris or residuals from the MGP, the surface soils were imported to the site after the MGP operations ceased, possibly for final grading purposes during the construction of Stuyvesant Town. Detected concentrations of constituents are likely attributable to the imported fill quality, anthropogenic sources, and/or naturally occurring sources that are not related to the former MGP operations.
- Subsurface Soil – Soil to a depth of approximately 5 feet below ground surface (ft bgs) is also believed to be imported fill that was used to grade the site during the construction of Stuyvesant Town. As a result, constituent concentrations to a depth of 5 ft bgs are generally not believed to be associated with the former MGP.

  MGP impacts have been observed in soil at depths below 5 ft bgs in limited areas at the site. A comparison of the results to the NYSDEC 6NYCRR Part 375 Soil Cleanup Objectives for Restricted Residential Use, i.e., gardens/single family residence are not permitted, indicates that constituent exceedances of criteria are associated with the following classes of compounds: Volatile Organic Compounds (VOCs) including benzene, toluene, ethylbenzene, and xylene (BTEX) and polynuclear aromatic hydrocarbons (PAHs). Approximately 9,600 cubic yards (c.y.) of soil are thought to contain constituent concentrations that exceed the regulatory criteria. The majority (> 90%) of the impacted material is located in the saturated zone, i.e., below 8 ft bgs.
- Groundwater – One unconfined, unconsolidated overburden aquifer is present beneath the site. Groundwater occurs at nominal depths of 8 ft bgs and 5 ft bgs at on-site and off-site locations, respectively. The groundwater flow direction is towards the East River. Impacted groundwater, i.e., groundwater containing at least one MGP-related compound at a concentration exceeding its respective NYSDEC Ambient Water Quality Standard or Guidance Value (AWQSGV) is present at on-site locations in the shallow (5-15 ft bgs) and intermediate (25-35 ft bgs) zones. Off-site exceedances appear to be limited to the intermediate zone, and no impacts above criteria have been observed in the deep zone (40-70 ft bgs).
- Indoor Air – Soil gas and indoor air samples have been obtained from and around the three buildings at the site during four separate investigations, and as recently as the first quarter of 2010. The results do not suggest that indoor air is being adversely impacted by the subsurface conditions. Concentrations of constituents of interest in indoor air greater than the established background levels (90th percentile) are limited to chlorinated VOCs and are likely associated with indoor sources, including cleaning materials, in basement storage areas.

- A qualitative human health assessment was performed for the Stuyvesant Town Site, including the East 14th Street, East 17th Street and East 19th Street Station sites. The results from the assessment indicate that there is a low potential for complete risk pathways for apartment building residents, commercial building occupants, site visitors or pedestrians. However, subsurface maintenance/utility workers may be exposed to impacted soil or groundwater via direct contact (i.e., incidental ingestion, dermal contact, and inhalation of volatiles or particulates) while performing subsurface work. There is also the possibility that excavation beneath the building foundations could temporarily provide a potential pathway for subsurface vapors into the basement/crawl space areas of site structures. Con Edison has developed an Interim Site Management Plan (ISMP) to ensure that procedures are in place to address potential exposure risks from MGP.

This AAR has been prepared in accordance with DER-10, Technical Guidance for Site Investigation and Remediation (DER-10) (NYSDEC, 2010), to define site-specific remedial action goals/objectives and identify an appropriate approach to address the environmental conditions encountered at the site. Summaries of activities/conclusions associated with the sequential steps in the alternative analysis process are provided in the following sections.

Defining Remedial Goals/Objectives

The goal for remedial activities at the East 17th Street Station site is to eliminate/mitigate the potential risk posed by MGP residuals and to remove the source of MGP contamination to the extent feasible. Achieving the Remedial Goal for the site will require that the remediation activities eliminate the potential exposure pathways for users of the property and remove sources of MGP contamination to the extent feasible given the continued use of the property for multi-unit residential use. The following media-specific Remedial Action Objectives (RAOs) have been developed to achieve the Remedial Goal for the site:

Soil

- Eliminate the potential for direct contact with MGP residuals for media having constituent concentrations that exceed Part 375 soil criteria for restricted residential use.
- Reduce, to the extent feasible, MGP impacts that are adversely affecting groundwater quality.
- Control the migration of remaining MGP impacts that have the potential to be mobile as separate-phase product.

Groundwater

- Eliminate the potential for direct contact/ingestion of groundwater having MGP constituent concentrations that exceed NYSDEC Ambient Water Quality Standard Guidance Values (AWQSGVs).
- Reduce, to the extent feasible, the dissolved-phase concentrations of MGP constituents.

Soil Gas

- Eliminate the potential for vapor intrusion that affects indoor air quality for residents of site buildings.

These RAOs are intended to address potential risks identified in the Qualitative Human Health Assessment. When evaluating an alternative, the impacts to the current property use are also considered. In addition, the physical limitations imposed by the site setting are taken into account during the evaluations.

Identification of Applicable Technologies

The initial step in the process of selecting the appropriate remedial alternative was the identification of a set of general response actions and their evaluation using two fundamental criteria: Site-Specific Appropriateness (implementability given the current and future site use) and Protectiveness (ability to limit risk/reduce contamination). Institutional controls were identified as appropriate means to eliminate exposure pathways for MGP impacts in soil, groundwater and soil gas at the site. Excavation/disposal and in-situ treatment were identified as appropriate general response actions for impacted soil.

The second step in the analysis was the evaluation of specific treatment processes/approaches associated with those general response actions that were determined to have the potential to provide remedial benefit at the site. The technologies/approaches were reviewed based on their site-specific applicability and ability to achieve the site-specific RAOs, i.e., elimination of risk, and contaminant reduction to the extent feasible. The evaluation resulted in the identification of the following set of preferred approaches/ technologies for achieving the RAOs in each of the site media.

Elimination of Risk

- Institutional Controls – provide the most comprehensive, site-wide means for eliminating the potential exposure pathways associated with MGP impacts in soil, groundwater and soil gas. In addition to controlling site activities, the Institutional Controls will require notification to Con Edison and NYSDEC of changes in site conditions/use, resulting in an evaluation of the need to conduct additional remedial activities. Note however, that specific controls are subject to review and approval by the property owner.
- Excavation and Disposal – can mitigate the direct contact risk for the primary risk receptors (construction workers) by removing impacted soil from areas where construction could take place, e.g., utility corridors in open and accessible site areas. *In situ* treatment was determined to not be applicable for “shallow” impacts due to the potential for adverse surface effects, i.e., steam generation, potential for utility damage, etc.

Contaminant Reduction

- *In situ* Solidification (ISS) – in-situ treatment provides the ability to overcome the practical limitations of excavation in heavily urban areas (disruption posed by shoring installation at depths greater than approximately 10 ft. bgs) to reach the greatest quantity of impacted media at the site. ISS is preferable to *in situ* chemical oxidation to treat impacted media, since it is less susceptible to the effects of variations in media permeability and inconsistent application.

Alternatives Evaluation

The preferred technologies/approaches were assembled into a set of four remedial alternatives for the site. Note that for the purpose of this document, the evaluation of the “Complete Restoration” alternative has not been included since the potential risk from the relatively small quantity of impacted soil would not justify the demolition of the overlying buildings. The alternatives were evaluated using a set of prescribed criteria that included: overall protection of human health and the environment, compliance

with standards, criteria and guidance (SCGs), long-term effectiveness and permanence, reduction in toxicity, mobility, and volume (TMV), short-term effectiveness, implementability and cost. The final criterion, community acceptance, will be evaluated at a later time as part of the public hearing which is required by the Citizen Participation Plan. Descriptions of the alternatives and summaries of their associated evaluations are provided below:

Alternative 1 – NO ACTION

NO ACTION does not require any intrusive work; however, it does not address potential risks and does not meet the remedial objectives for the project.

Alternative 2 – Institutional Controls – includes the following activities:

- Institutional Controls as a legally binding mechanism to appropriately restrict property use, prohibit the use of groundwater and enforce the implementation of a finalized Site Management Plan (SMP). The SMP will require the use of controls to protect workers and the public during intrusive site maintenance activities. Additionally, it will require notification to Con Edison and NYSDEC of changes in site conditions/use, resulting in an evaluation and determination as to whether additional monitoring or remedial activities are required.

Institutional Controls maintains the condition of no significant risk, with no intrusive site activities and meets the remedial goal for the site. Costs are estimated to be $150,000.

Alternative 3 – Institutional Controls and Soil Removal – includes the following activities:

- Institutional Controls as a legally binding mechanism to appropriately restrict property use, prohibit the use of groundwater and enforce the implementation of a finalized Site Management Plan (SMP). The SMP will require the use of controls to protect workers and the public during intrusive site maintenance activities. Additionally, it will require notification to ConEd and NYSDEC of changes in site conditions/use, resulting in an evaluation and determination as to whether additional monitoring or remedial activities are required.

- Proactive removal of 400 c.y. of impacted soil in the vadose zone to minimize the direct contact risk to construction workers.

Institutional Controls and Soil Removal maintains the conditions of no significant risk and meets the remedial goal for the site, with limited contaminant removal. However, the removal of impacted soil from the vadose zone in anticipation of potential future utility/maintenance work could be un-necessarily disruptive to site residents since future utility work may not be required in all areas to be excavated. The principal intrusive site activity (vadose zone excavation) would be conducted over a 9-month period, with costs estimated to be $1,030,000.

Alternative 4 – Institutional Controls, Soil Removal and Source Material Control – includes the following activities:

- Institutional Controls as a legally binding mechanism to appropriately restrict property use, prohibit the use of groundwater and enforce the implementation of a finalized Site Management Plan (SMP). The SMP will require the use of controls to protect workers and the public during intrusive site maintenance activities. Additionally, it will require notification to ConEd and NYSDEC of changes in site conditions/use, resulting in an evaluation and determination as to whether additional monitoring or remedial activities are required.

- Removal of approximately 400 c.y. of impacted soil from the vadose zone , *in-situ* solidification of approximately 5,300 c.y. of impacted soil in the saturated zone in accessible areas of the site, and construction of a barrier wall (200 ft total length) to contain impacts located within inaccessible areas under the site buildings.

Institutional Controls, Soil Removal and Source Material Control maintains the conditions of no significant risk and meets the remedial goals for the site, but with extensive disruption from remedial actions, potentially without commensurate environmental benefit. The principal intrusive site activities (excavation and in-situ treatment of impacted soil) would be conducted over a 12-month period with costs estimated to be $5,470,000.

Recommended Alternative

Institutional Controls (Alternative 2) is the proposed remedial alternative for the site. This alternative includes the use of institutional controls as a legally binding mechanism to control potential exposure pathways for construction workers, residents and the general public. Additionally, Institutional Controls will require notification to Con Edison and NYSDEC of changes in site conditions/use, resulting in an evaluation and determination as to whether additional monitoring or remedial activities are required. Note however, that the institutional controls would have to be reviewed and approved by the site owner.

Alternative 2 was chosen because it meets the site-specific remedial goal with minimal short-term disruption/risk and provides sufficient flexibility to adjust to changes in site conditions. It would be implemented within a reasonable timeframe and would not require large temporary or permanent spatial considerations. This alternative does not significantly remove contamination and contaminants will remain in place, but Institutional Controls will address associated risk pathways. Additionally, the implementation of a Soil Management Plan will ensure notification of Con Edison and NYSDEC of any change in conditions and site use so that the need for additional remedial activities can be determined.

1.0 Introduction

The East 17th Street Station site is located in the borough of Manhattan in New York City, New York County, New York. The site occupied an area that is currently part of the Stuyvesant Town residential apartment complex in an area between East 17th/East 18th Streets and mid-way between Avenue B/Avenue C (Figure 1-1).

Consolidated Edison Company of New York, Inc. (Con Edison) is managing the site in accordance with Voluntary Cleanup Agreement (VCA) Index D2-0003-02-08 as negotiated with the New York State Department of Environmental Conservation (NYSDEC). This Alternatives Analysis Report (AAR) presents the results of the remedial alternative selection process for the site. It has been prepared in accordance with the most recent and applicable guidelines of the NYSDEC including DER-10, Technical Guidance for Site Investigation and Remediation (DER-10) (NYSDEC, 2010), to define site-specific remedial action goals/objectives, and identify an appropriate approach to address the environmental conditions encountered at the site. The document is formatted in the following manner: summaries of the site history and investigation results are presented in Section 2; the site-specific remedial goal and associated remedial action objectives are established in Section 3; a range of applicable remedial alternatives are evaluated in Section 4; an appropriate site remedy is proposed in Section 5; and references are provided in Section 6. The appendices provide summary tables for pertinent investigation data as well as cost information to support the evaluation of the remedial alternatives.

2.0 Site History and Investigation Summary

The following discussion provides a description of the East 17th Street Station site, including a review of its history; summaries of the findings from the environmental investigations and the associated Qualitative Human Health Exposure Assessment; and discussions of the on-going activities related to the Interim Site Management Plan (ISMP) in place at the site.

2.1 Site Description and History

2.1.1 Site Location and Description

The East 17th Street Station was located on a 1.5-acre parcel located between East 17th/East 18th Streets on the Western side of Avenue C, and is designated as Block 972, Lot 1 on the tax map of the City of New York, New York (Langan, 2003). The former East 17th Street Station site (Figure 2-1) is located adjacent to the Avenue C Loop Road within the present-day residential campus of Stuyvesant Town, which extends across 61-acres from First Avenue to Avenue C and from East 14th Street to East 20th Street. The complex includes 35 high-rise buildings, playgrounds, sport courts, and underground parking garages.

The portion of the Stuyvesant Town campus associated with the East 17th Station site contains portions of three residential high-rise apartment buildings, playgrounds and courts, and a private underground parking garage. The Stuyvesant Town property has been most recently owned by an affiliate of Tishman Speyer Properties, L.P. and Blackrock Realty Advisors, Inc. The New York City Planning Commission designates the majority of the property as R7-2: Moderate to High-Density Residential District (GEI, 2007a).

2.1.2 Adjoining Property Descriptions

The remainder of the Stuyvesant Town apartment complex surrounds the East 17th Street Station Site. Con Edison facilities are located east of Stuyvesant Town between East 18th /East 14th Streets and Avenue C/FDR Drive. These facilities include the East River Generating Station, various substations, an administration building, ball fields, and parking areas.

2.1.3 Site History

2.1.3.1 Pre-Manufactured Gas Plant

The site area was formerly part of the East River and associated marshlands well into the 1800s. With the increasing population and growing demands of New York City, the area gave way to more industrial planning and development, and as a result, the area east of First Avenue, between East 13th and East 26th Streets, required filling and reworking to extend the shoreline to its present location and elevate the grade of the land. Tenements were constructed in the area subsequent to the filling and prior to the development of the former MGP station sites as gas storage and/or gas plant facilities (GEI, 2007a).

2.1.3.2 Manufactured Gas Plant

The East 17th Street Station site occupied an area between and East 17th and East 18th Streets on the western side of Avenue C (mid way between Avenue B and Avenue C) and operated as a gas storage facility from the periods of 1860-1867 to sometime between 1921 and 1924 when the station was decommissioned. Historic Sanborn® maps show two gasholders (approximately 270,000 cubic feet capacity each), a pipe storage yard, cinder yard, and office buildings on the station parcel. The East 17th Street Station was part of the larger facility called the East 14th Street Works, which was operated by Con Edison's predecessor companies including the Consolidated Gas Company of New York, the New York Steam Company, the Standard Gas Company, and the Manhattan Gas Light Company (Langan, 2003). The majority of that larger facility was located on the eastern side of Avenue C between East 14th and East 16th Streets.

2.1.3.3 Post-Manufactured Gas Plant

A number of residential, commercial, and industrial properties occupied the area that is now the Stuyvesant Town residential campus. MetLife acquired the properties within the 18-block footprint of Stuyvesant Town during the early to mid-1940s for future construction of post-war housing units. Approximately 3,100 residences and 500 commercial and industrial facilities were razed as part of the project. Any remaining aboveground structures initially related to the East 17th Street holder station would have been removed at that time along with surrounding structures to facilitate the construction of the Stuyvesant Town apartment complex.

Currently, portions of residential buildings at 285 Avenue C, 287 Avenue C and 16 Stuyvesant Oval and an underground parking garage occupy the area of the former East 17th Street Station. In addition, a portion of the adjacent service road and pedestrian walkways appear to be located within the former station footprint.

2.2 Investigation Summary

Several investigations have been performed at the East 17th Street Station site and are listed below.

- MGP Research Report and Preliminary Environmental Evaluation performed by Langan in 2001
- Evaluation of Indoor Air and Soil Gas Sampling performed by RETEC in 2003
- Site Characterization Study (SCS) performed by Haley & Aldrich, Inc. (H&A) in 2004
- Interim Remedial Investigation performed by GEI in 2007
- Water valve replacement activities performed by the property owner with oversight provided by RETEC/GEI in 2006 and 2007
- Remedial Investigation (RI) performed by AECOM from 2006 through 2008

The reports resulting from these investigations are listed in the reference section of this report. The results of these investigations were summarized or compiled in the Stuyvesant Town Remedial Investigation Report (RIR) (AECOM, 2009) and are briefly discussed in this subsection. For more detail on specific topics, refer to the Stuyvesant Town RIR (AECOM, 2009).

2.2.1 Site Setting

2.2.1.1 Topography and Drainage

The surface topography of Stuyvesant Town is made-land and ranges from approximately 4 to 22 feet above Mean Sea Level (MSL) (GEI, 2007a). The areas not covered by buildings were developed to include loop roads with additional parking. The property also includes a single-level parking garage that is situated only slightly below the adjacent street grade. Above the garage structure are playgrounds, landscaped areas, and paved walkways. Precipitation reaching the ground infiltrates landscaped areas or drains towards the storm water basins located along the perimeter roads and loop roads.

2.2.1.2 Site Infrastructure

The utility infrastructure underlying Stuyvesant Town is complex and not completely documented. H&A conducted a review of available utility maps in 2004 and determined that a dense network of numerous private and public utility lines of varying size are present beneath the site. Additionally, a large number of inactive and abandoned lines that once served the pre-Stuyvesant Town community are believed to traverse the site. These utilities are not completely detailed on existing site plans.

2.2.1.3 Site Geology

The site geology consists of four units of varying thickness and distribution across the site. Starting at ground surface, these units consist of fill; organic clay, silt, and or peat; glacial deposits and bedrock.

The fill layer beneath the former MGP station consists of intermixed sand, silt, and gravel with varying amounts of brick, concrete, boulders, wood, ash, cinders, metal fragments, and glass. Clinker and ash-like material along with bricks and concrete, were occasionally observed in split-spoon samples during the investigations. The fill most likely reflects man-made disturbances to pre-existing natural soils from historical building construction and eastern expansion of the shoreline. In general, the fill thickness varies between 20 and 30 ft bgs across the site, but was observed to reach a depth of almost 50 ft bgs at a location adjacent to the former gasholders locations.

Deposits of organic material were encountered within and beneath the fill layer at the site, as well as in nearby adjacent areas. The deposits consist mainly of gray to black clayey silt, organic silt, and brown to black peat. Deposits are characterized by an organic or hydrogen sulfide-like odor. In a number of borings, shell fragments were found along with plant material. The organic deposits found during the various drilling activities are consistent with low energy marsh and mud flat environments, which existed in the area up through the early 1800s. The organic deposits, therefore, reflect those former mud flats and stream and creek beds known to have fed the East River in this area. The inconsistencies in the presence of these deposits are attributable to the infilling and leveling activities associated with extending the shoreline eastward.

Glacial deposits were encountered beneath the fill and peat/organic deposit layers. The deposits consist primarily of glacial lacustrine deposits that were interbedded and underlain by layers of glacial till and outwash. The majority of the environmental borings drilled during the site characterization and remedial investigation activities at Stuyvesant Town were completed within the glacial deposits. The glacial lacustrine deposits consist of layers of gray to red-brown sand, silty sand, silt and clay, and clay. There is a fine-grained sand layer beneath the fill/organic deposits, where they are present. This fine-grained sand layer may be remnants of the damming of the Hudson River by the Harbor Hill Terminal Moraine, which dammed the river to the south (Meguerian, 2003).

Borings advanced at the East 17th Street Station site did not extend to bedrock. However, published information indicates that bedrock in the vicinity of the East 17th Street Station site is located at depths below 80 ft. bgs (Baskerville, 1994).

2.2.1.4 Site Hydrogeology

There is no surface water on the site. The East River is the closest surface water body to the site and is located approximately 400 ft from the East 17th Street Station site boundary to the east. The East River is classified by the NYSDEC as a Class I saline surface water, i.e., its best usages are for secondary contact recreation and fishing. Note however that portions of the East River in Manhattan have been posted to prohibit fishing. . The East River is tidally influenced, and has measurable effects on groundwater elevations in adjacent areas.

One unconfined, unconsolidated overburden aquifer is present beneath the site. Shallow (5 to 15 ft bgs), intermediate (25 to 35 ft bgs) and deep (40 to 70 ft bgs) zones within the overburden aquifer were evaluated during the site investigations. Groundwater occurs at on-site locations at a nominal depth of 8 ft bgs, and at a nominal depth of 5 ft bgs in the area of the Avenue C right-of-way (ROW). The groundwater flow direction in all of the depth zones is to the east-southeast towards the East River. However, flow may vary locally due to the heterogeneity of fill materials in the upper portions of the aquifer, or the effect of man-made structures.

The horizontal gradients across the Stuyvesant Town site range from 0.01 ft/ft and 0.002 ft/ft for the shallow zone, and 0.008 ft/ft to 0.005 ft/ft for the intermediate zone (GEI, 2007a). Calculations were not conducted for the deep groundwater zone due to the limited number of monitoring wells screened in this interval. The vertical gradient between the units is generally downward at the site. Based on calculated horizontal gradients and hydraulic conductivities, the average linear flow velocity across the site for the shallow zone has been estimated to range between approximately 390 ft/yr and 520 ft/yr. The estimated linear flow velocity in the intermediate zone is estimated to be approximately 70 ft/yr.

2.2.2 Investigation Data Summary

This section presents a summary of the findings of the previous investigations and includes field observations and analytical results by media including surface soil, subsurface soil, groundwater, and soil gas/indoor air.

2.2.2.1 Surface Soil

The surface of the site is covered with high-rise apartment buildings, landscaped areas, asphalt roads/ walkways, concrete parking garage and paved recreational areas. As noted in the previous investigation reports, the surface soil appears generally distinct from the MGP-impacted lower fill and soil material. Based on historical site information and other physical evidence, the surface soils were imported to the site after the MGP operations ceased, possibly for final grading purposes during the construction of the Stuyvesant Town complex. It is considered likely that any elevated concentrations of semivolatile organic compounds (SVOCs), polycyclic aromatic hydrocarbons (PAHs), and metals observed in the site surface soils are attributable to the imported fill quality, anthropogenic sources, and/or naturally occurring sources that are not related to the former MGP operations. Surface soil results have been compared to New England urban soil background levels and/or Eastern United States background values (provided in Appendix H – Table 1 of the RIR), with constituent concentrations generally found to be within the researched background concentration ranges.

2.2.2.2 Subsurface Soil

Results from the SC and RI indicate that physical evidence of MGP-related impacts in the subsurface is enerally limited to locations within, and in the vicinity of the former gasholders. Additional observations from the water valve replacement program (GEI, 2007b) identified three off-site locations with evidence of MGP staining and odors. As illustrated in the cross sections presented as Figures 2–2A and 2-2B, these impacts (staining/sheen) are primarily limited to the saturated zone at depths below 8 ft bgs.

In general, the highest concentrations of MGP constituents (BTEX and PAHs) were associated with soils exhibiting observable impacts, e.g. staining and odor. Analytical data for the soil samples collected as part of the investigations were compared to the NYSDEC 6NYCRR Part 375 Restricted Residential Use Soil Cleanup Objectives (RRUSCOs) and the results are presented in Appendix A of this report. Table A-1 provides a summary of the results for shallow soils (fill to depths of 0.1-17 ft bgs), while summaries for intermediate/deep soils (fill and native soil at depths below 17 ft bgs) are presented in Table A-2. Locations exhibiting exceedances of the RRUSCO criteria (for at least one MGP constituent) in the shallow, and intermediate/ deep soil intervals are identified in Figures 2-3A and 2-3B, respectively. The figures illustrate the following:

- Criteria exceedances for shallow soils are limited to material within and immediately adjacent to the southern holder; locations immediately to the west of the northern holder; a location to the east of the holders (across the Avenue C Loop Road); and an isolated location in the ROW along the western side of Avenue C.
- Exceedances in the intermediate/deep soil interval are limited to areas beneath the holders and the location to the east of the holders (across the Avenue C Loop Road).

The subsurface soil results from locations outside of the immediate vicinity of the holders generally delineate MGP-related impacts associated with the East 17th Street Station.

2.2.2.3 Groundwater

One unconfined, unconsolidated overburden aquifer is present beneath the site. Groundwater occurs at depths ranging from approximately 5 to 8 ft bgs. The groundwater flow direction in all of the depth zones is towards the East River. Groundwater samples have been collected from two monitoring well clusters located within the footprint of the former East 17th Street Station, as well as two monitoring well clusters at downgradient, off-site locations within the ROW along the western side of Avenue C. Based on the analytical results and conclusions from the RI, the main MGP-related compounds detected in the groundwater samples were BTEX and occasionally PAHs. Iron, manganese, and sodium were the only metals detected at concentrations exceeding the AWQSGV in groundwater beneath the East 17th Street Station. These metals are not considered to be associated with the former MGP station operations. A summary of the groundwater analytical results for the on-site and off-site monitoring wells, with a comparison of the data to the NYSDEC Ambient Water Quality Standards or Guidance Values (AWQSGVs) listed in Technical and Operations Guidance Series (TOGs) 1.1.1, is presented in Appendix B. The results are presented separately for the three zones evaluated during the investigation effort: shallow (5 to 15 ft bgs), intermediate (25 to 35 ft bgs), and deep (40 to 70 ft bgs), and are discussed below.

2.2.2.4 Shallow Aquifer Zone

As presented in Table B-1, concentrations of BTEX and naphthalene were determined to be in compliance with NYSDEC AWQSGVs at the location immediately adjacent to the holders (17MWS04),

while exceedances for several MGP constituents have been noted at another downgradient, on-site location (17MWS03).

The off-site monitoring wells, 17MWS05 and 17MWS06 were sampled as part of the 2006 and 2008 field events. The concentrations of MGP constituents were generally determined to be in compliance with AWQSGV criteria for both sampling events. Note that trace levels of PAHs have been observed in both on-site and off-site locations.

2.2.2.5 Intermediate Zone

As presented in Table B-2, several BTEX and PAH compounds exceeded the NYSDEC AWQSGV in groundwater samples collected from intermediate zone wells at both on-site locations, as well as one off-site location (17MWD05) located approximately 200 ft downgradient from the site. Note that the constituent exceedances at the off-site location include a number of chlorinated organic compounds, e.g., vinyl chloride, that are not present at on-site locations and are not typically associated with MGP residuals.

2.2.2.6 Deep Zone

The deep zone groundwater analytical results for the East 17th Street Station are presented in Table B-3. No significant exceedances of the NYSDEC AWQSGVs for MGP constituents were noted at either on-site or off-site locations.

2.2.2.7 Indoor Air and Soil Gas

Soil gas and indoor air samples were obtained from and around buildings associated with the East 17th Street Station during the investigations of the site in 2003 and 2006. A summary of the soil gas/indoor air data is provided in Appendix C as Table C-1. The soil gas data indicates the presence of chlorinated organic compounds, alkanes, methyl tert-butyl ether and several aromatic hydrocarbons. The results indicate that subsurface impacts are associated with cleaning solvents (chlorinated compounds), petroleum (aromatic compounds, alkanes, MTBE) and potential MGP residuals (aromatic compounds). Note that several compounds likely to be specific to MGP residuals (indane, indene and thiophene) were not detected in the soil gas samples. Associated indoor air samples demonstrated that elevated constituent levels, i.e. concentrations greater than established background levels (90th percentile) were limited to chlorinated solvents. The results suggest that indoor air levels of contaminants are not the result of vapor intrusion, but rather the effect of the use of cleaning supplies in basement areas.

2.3 Qualitative Human Health Assessment

A qualitative human health assessment was performed for the Stuyvesant Town site (including East 14th Street, East 17th Street and East 19th Street Stations) following guidelines specified in the NYSDEC DER-10 Draft Technical Guidance for Site Investigation and Remediation, and is provided in the Stuyvesant Town RIR (AECOM 2009). An exposure pathway analysis for site receptors was developed and included the identification of each potential receptor group, a listing of each potential exposure media and potential pathway, and a rationale for inclusion or exclusion of each potential receptor in the consideration of remedial actions for the alternatives analysis. A summary of the assessment is provided below.

Potential receptors to MGP-related impacts at the site include apartment building residents, day care attendees, commercial building occupants/parking lot attendants, maintenance workers, subsurface outdoor maintenance or utility workers, and site visitors or pedestrians.

2.3.1 Potential Exposure to Impacted Surface Soil and Subsurface Soil

It is believed that surface soil and the upper 5 feet of subsurface soil at the site were imported to the site following cessation of the MPG operations. Sampling and analysis of these media indicate that the concentrations of VOCs and SVOCs are low and similar to background concentrations. Surface soils at the site are generally paved or located beneath the parking garage slab and the potential for people to come into contact with surface soils is low. For these reasons, the potential for receptors to be exposed to contaminants of concern (COCs) in these soils is considered to be low.

However, subsurface maintenance or utility workers may be exposed to impacted subsurface soil containing COC and NAPL via direct contact (i.e., incidental ingestion, dermal contact, and inhalation of volatiles or particulates) while performing subsurface utility work or structure repair. Only properly trained personnel should complete subsurface work at depths below approximately 5 ft bgs at the site using methods specified in the Interim Site Management Plan (ISMP), until the area has been cleared of impacted materials. Note that the ISMP, which is discussed further in Section 2.4, includes an example Health and Safety Plan (HASP). This exposure pathway will be addressed in the alternatives analysis for the site. The potential for inhalation of VOCs originating from impacted soil is addressed in subsection 2.3.3.

2.3.2 Potential Exposure to Impacted Groundwater

Groundwater is not extracted for drinking or other purposes in the vicinity of the site. The potential for apartment building residents, commercial building occupants, site visitors and pedestrians, and maintenance workers to be exposed to impacted groundwater via direct contact is not likely and is not considered a complete exposure pathway.

Outdoor maintenance and utility workers may be exposed to COC or NAPL in groundwater via incidental ingestion, dermal contact, and inhalation of volatiles or particulates during subsurface activities. Only properly trained personnel should complete subsurface work at the site using methods specified in the ISMP, until the area has been cleared of impacted material. This exposure pathway will be addressed in the alternatives analysis for the site. The potential for inhalation of VOCs originating from impacted groundwater is addressed in subsection 2.3.3.

2.3.3 Potential Exposure to Impacted Air

Apartment building residents, commercial building occupants, maintenance workers, and site visitors could potentially be exposed to unacceptable levels of MGP-related constituents if the vapor intrusion route into the basement/crawlspace areas of the buildings was present. The results of the soil vapor intrusion and indoor air quality evaluation performed in each of the buildings at the site indicate that the vapor intrusion pathway is not complete. The existing, intact basement floor structures in the apartment buildings have proven to be effective barriers to stop the migration of subsurface vapors into buildings. Therefore, the potential to be exposed to air impacted by MGP-related COC is considered to be low under current conditions. However, there may be unique considerations when working inside structures at the site during planned and emergency utility work that involves cutting or drilling into concrete slabs in the basements of the site buildings or parking garage. There is the possibility for workers to temporarily provide a potential pathway for subsurface vapors into site buildings. The potential for a resident, occupant, maintenance worker, or visitor to be exposed to air impacted by MGP-related COC during sub-slab activities is considered to be low and any potential exposure would be limited in duration and preventive measures would be used. However, the inhalation of VOCs by these receptors is considered to be potentially complete and will be addressed in the alternatives analysis.

Subsurface outdoor maintenance and utility workers could potentially be exposed to MGP-related COC by the inhalation of volatiles or particulates resulting from the disturbance of MGP-impacted soil or groundwater during subsurface activities. Therefore, the inhalation of VOCs by these receptors is considered to be potentially complete and will be addressed in the alternatives analysis.

2.4 Interim Site Management Plan

ConEdison has developed an Interim Site Management Plan (ISMP) to ensure that procedures are in place to address potential exposure risks from MGP residuals to site workers, residents and the general public. Discussions of on-going activities related to indoor air monitoring and NAPL monitoring are provided below.

2.4.1 Indoor Air Monitoring

Monitoring is being conducted on an annual basis in the basement/crawlspace areas of the site buildings located above the holders to confirm that indoor air has not been impacted by MGP residuals. Indoor air samples are collected from site buildings using laboratory certified, six-liter volume Summa canisters. The sampling locations are consistent with those used in previous sampling events.

A summary of the results from the 2009 and 2010 programs are provided in Appendix C (Table C-2 and C-3, respectively). The results demonstrate that indoor air concentrations of VOCs are generally consistent with background levels established by NYSDOH. Concentrations of constituents that were greater than established background levels continue to be limited to several chlorinated constituents at concentrations ranging from 1 to 26 $\mu g/m^3$, and are thought to be associated with indoor sources were observed at a single location in the stairwell of the building.

2.4.2 NAPL Monitoring

Water level measurements are being collected from the existing monitoring well network on a quarterly basis, and as recently as December of 2009. NAPL has not been observed in the monitoring wells associated with the 17th Street Station Site. The results are consistent with the findings of the RIR. As indicated in a letter dated August 10, 2010, NYSDEC agreed with the recommendation that monitoring activities be discontinued at wells located on the East 17th Street site.

3.0 Remedial Action Goals and Objectives

3.1 Remedial Goal

The Remedial Goal for the East 17th Street Station site is to eliminate or mitigate the potential risk posed by MGP residuals and to removal the source of MGP contamination to the extent feasible.

3.2 Remedial Action Objectives

Achieving the Remedial Goal for the site will require that the remediation activities result in the elimination of the potential exposure pathways identified in the Qualitative Human Health Assessment for media that exceed the applicable standards, criteria, and guidance (SCGs); and remove sources of MGP contamination to the extent feasible. The SCGs for the site include the NYSDEC Part 375 Soil Criteria for Restricted Residential Use and the NYSDEC Ambient Water Quality Standards and Guidance Values. Therefore, the following media-specific Remedial Action Objectives (RAOs) have been developed:

3.2.1 Soil

- Eliminate the potential for direct contact with MGP residuals for media having constituent concentrations that exceed Part 375 soil criteria for restricted residential use
- Reduce, to the extent feasible, MGP impacts that are adversely impacting groundwater quality
- Control the migration of remaining MGP impacts that have the potential to be mobile as separate-phase product

3.2.2 Groundwater

- Eliminate the potential for direct contact/ingestion for media having constituent concentrations that exceed AWQSGVs
- Reduce, to the extent feasible, the dissolved-phase concentrations of MGP constituents

3.2.3 Soil Gas

- Eliminate the potential for vapor intrusion that affects indoor air quality for residents of site buildings

The RAOs will be used in the alternative analysis to facilitate the evaluation of general response actions and associated remedial technologies. When evaluating the ability of response actions or technology to achieve the RAOs, the physical limitations imposed by the site setting and potential effects for the current property use will also be considered.

4.0 Development and Analysis of Alternatives

The results from site investigation activities have identified MGP impacts in soil and groundwater at the site. The following discussion provides an evaluation of a set of alternatives determined to be appropriate for use at the East 17th Street Station site to determine if they would be effective and practical in meeting the remedial goal for the site. The following discussion provides a discussion of the media impacts (soil, groundwater, soil gas) at the site, and a review of the remedial alternatives determined to be applicable/beneficial in eliminating risk and reducing site contamination.

4.1 Summary of MGP Impacts

4.1.1 Soil

As indicated in Section 2, historical information documents that shallow soils were imported to the site after the MGP operations ceased, possibly for final grading purposes during the construction of the Stuyvesant Town complex, and the presence of MGP impacted soil at the East 17th St Station site is primarily limited to depths of 8 ft to 30 ft bgs. To facilitate the evaluation of response actions/ technologies, the quantities of impacted soil have been grouped in the following depth intervals:

- Vadose Zone Soil – the general upper limit of MGP impacts (5 ft bgs) to a nominal depth of the water table at 8 ft bgs)
- Upper Fill – nominal depth of 8 ft bgs to a nominal depth of 20 ft bgs
- Lower Fill/native soil – below a nominal depth of 20 ft bgs

Figure 4-1 illustrates the limits of MGP soil impacts by depth interval based on visible impacts and the locations of soil samples that contained at least one compound at a concentration exceeding the RRUSCOs. The depth intervals are illustrated using the following color key: vadose zone impacts – red hatch pattern; upper fill impacts – green hatch pattern; and lower fill/native soil impacts – black stipple pattern.

The investigation results indicate that approximately 9,600 c.y. of MGP impacted soil is present in two general areas of the site: within the southern holder / immediately adjacent to and beneath both holder structures; and a smaller area located to the east of the holders (across the Avenue C Loop Road). The impacts located across the Avenue C Loop Road are not thought to be associated with the principal holder release due the presence of continuous impacts from the vadose zone to the native soil intervals at the location and the observation of relatively un-impacted soil areas to the west of the road. Note that the results presented in Section 2 of this document indicate an additional exceedance of the NYSDEC soil criteria at a location in the Avenue C ROW. However, constituents at this shallow location (5-7 ft bgs) are limited to a few PAHs which are believed to be associated with urban fill rather than MGP residuals.

Summaries of the estimated quantities of impacted media in each area/depth interval are presented in Table 4-1. As indicated, more than 90% of the impacted soil is located in the saturated zone, with approximately 40% of that material located under/immediately adjacent (within 10 ft of the building) residential housing buildings. For the purpose of this evaluation, this material is not considered to be accessible for remediation.

4.1.2 Groundwater

The results from the site investigation indicate that groundwater impacts are relatively limited at the site. The most recent analytical data (2008) were compared with AWQSGVs to generate Figure 4-2, which illustrates the general limits of groundwater impacts for the principal, soluble MGP constituents (BTEX and naphthalene) within the shallow, intermediate, and deep zones of the overburden aquifer. As illustrated in this figure, groundwater impacts, i.e. groundwater containing at least one MGP-related compound at a concentration exceeding its respective AWQSGVs, are present within the site in the shallow and intermediate zones, and extend to off-site areas in the intermediate zone. As indicated previously in Section 2.2.2.5, it is not clear from the limited data set whether the impacts observed in the intermediate zone within the Avenue C ROW are associated with the source material discussed above (Section 4.1.1) or another localized source, potentially not related to the East 17th Street Station. No exceedances of MGP-related AWQSGVs were noted in the deep zone.

4.1.3 Soil Gas

Data collected during several indoor air monitoring programs in recent years has documented that the vapor intrusion pathway is not complete at the site. However, soil gas remains a potential media of concern in the event that a future change in conditions or site use would result in an increase in indoor air concentrations of MGP constituents to levels that exceed NYSDOH guidelines.

4.2 Alternatives Evaluation

The analysis of alternatives has been conducted in accordance with the guidance provided in DER-10, for sites in the Voluntary Cleanup Program, Section 4.4 (a)(2)(iv), which eliminates the requirement to formally document a Feasibility Study (FS) level evaluation of remedial approaches. A summary of the findings from the preliminary steps in the development of alternatives, i.e. the identification of general response actions and evaluation of associated technologies is provided below.

The initial step in the process of selecting an appropriate remedial alternative was the identification of a set of general response actions and their evaluation using two fundamental criteria: Site-Specific Appropriateness (implementability given the current and future site use) and Protectiveness (ability to limit risk/reduce contamination). The following response actions were determined to be applicable for use at the site:

- Institutional controls were identified as appropriate for eliminating exposure pathways for MGP impacts in soil, groundwater and soil gas at the site.
- Excavation/disposal and in-situ treatment were identified as appropriate general response actions for impacted soil. Both actions were determined to provide some benefit in reducing site-wide levels of contamination and associated dissolved-phase concentrations of MGP constituents, but were limited by an inability to access all impacted media due to the presence of existing site structures.

The second step in the analysis was to evaluate specific treatment processes/approaches associated with those general response actions that have the potential to provide remedial benefit at the site.

The technologies/approaches were reviewed based on their site-specific applicability and ability to achieve the RAOs that have been developed for the site, i.e. elimination of risk, and contaminant reduction to the extent feasible. The evaluation resulted in the identification of the following set of preferred approaches/technologies for achieving the RAOs in each of the site media

4.2.1 Elimination of Risk

- Institutional Controls – provide the most comprehensive, site-wide means for eliminating potential exposure pathways associated with MGP impacts in soil, groundwater and soil gas. In addition to requiring the use of protective controls during intrusive site activities, the Institutional Controls will require notification to Con Edison and NYSDEC of changes in site conditions/use, resulting in an evaluation of the need to conduct additional remedial activities. Note, however, that specific controls are subject to review and approval by the property owner.
- Excavation and Disposal – can mitigate the direct contact risk for the primary risk receptors (construction workers) by removing impacted soil from areas where construction could take place, e.g. utility corridors in open and accessible site areas. In-situ treatment was determined to not be applicable for shallow impacts due to the potential for adverse surface effects, i.e. steam generation, potential for utility damage, etc.

4.2.2 Contaminant Reduction

- *In situ* Solidification (ISS) – in-situ treatment provides the ability to overcome the most significant limitations of "deep" excavation in heavily urban areas (disruption posed by shoring installation at depths greater than approximately 10 ft. bgs) to reach the greatest quantity of impacted media at the site. ISS is preferable to *in situ* chemical oxidation since treatment efficiency is not subject to variability of subsurface media (organic content and relative permeability), and the approach does not provide the potential for mobilization of constituents, or the generation of "surface effects", e.g., steam in areas proximate to buildings that would be disruptive to the activities of residents.

These preferred technologies/approaches from the previous section have been assembled into the following set of four alternatives:

- Alternative 1 – NO ACTION
- Alternative 2 – Institutional Controls
- Alternative 3 – Institutional Controls and Soil Removal
- Alternative 4 – Institutional Controls, Soil Removal and Source Material Control

Note that for the purpose of this document, the evaluation of the "Complete Restoration" alternative has not been included since the potential risk from the relatively small quantity of impacted soil would not justify the required relocation of over 250 families and demolition of the apartment buildings.

The following discussion reviews the selected alternatives based on their ability to meet the site-specific Remedial Goal as well as the following criteria:

- Overall protection of human health and the environment – considers how the remedial alternative prevents or mitigates potential risks under current and likely future conditions. Alternatives that maintain the current condition of no significant risk or that permanently reduce or eliminate exposure pathways under any reasonable future site use without causing significant risks during implementation, are rated as "GOOD." A "FAIR" rating is applied to alternatives that provide adequate protection of human health and the environment but have one or more potential drawbacks, such as reliance on long-term maintenance or institutional controls, and uncertainty regarding the final levels of contamination. A "POOR" rating applies to alternatives that do not protect against reasonably foreseeable future exposures to site contaminants or may

increase the likelihood of certain exposure scenarios (e.g., increased contaminant mobility or toxicity). A rating of "UNACCEPTABLE" is given to alternatives that, on balance, pose more risks to human health and the environment than NO ACTION.

- Compliance with standards, criteria and guidance values (SCGs) – addresses whether the remedy will meet the remedial goals and SCGs presented in Section 3. For the purpose of this evaluation, the principal applicable standards/criteria have been assumed to be the Part 375 soil criteria for restricted residential use and the Ambient Water Quality Standards and Guidance Values for groundwater. A rating of "GOOD" is given to alternatives that are expected to achieve all the remedial goals and either achieves the SCGs or is expected to result in significant reductions (90% or more) in current concentrations. A rating of "FAIR" is given if an alternative will achieve the remedial goals but is not expected to achieve the SCGs. A rating of "POOR" is given if an alternative is not expected to achieve most of the remedial goals and SCGs.
- Long-term effectiveness and permanence – evaluates the magnitude of remaining risks and the adequacy and reliability of controls. Alternatives received a rating of "GOOD" if there is a reasonable expectation that the primary objectives can be met and maintained. Alternatives that do not require maintenance of any on-going site controls generally were rated higher than alternatives that required on-going maintenance activities. Alternatives that completely remove or completely destroy contaminants received a better rating than alternatives that change the chemical composition or rely on containment. If an alternative has been successfully implemented at another MGP site under similar conditions and demonstrated long-term effectiveness, the remedial action generally receives a rating of "GOOD". A rating of "FAIR" was given to alternatives that had a reasonable expectation of providing a permanent remedy. Alternatives with a "FAIR" rating may result in contaminants remaining in place and may require long-term maintenance of controls. A "POOR" rating was given to alternatives that do not remove or treat contaminants, do not provide adequate controls to prevent future exposure scenarios, or rely on on-going maintenance of controls that will be difficult to assure. A rating of "UNACCEPTABLE" is given to technologies that have been tested under similar conditions and were found to be ineffective.
- Reduction in toxicity, mobility, and volume (TMV) – considers the quantity of contaminants that are permanently destroyed, immobilized, or otherwise treated. The degree to which the treatment may be irreversible, and the nature and amount of treatment residuals are considered. Alternatives that remove contaminants from the site or that fully treat (i.e., mineralize) contaminants received a rating of "GOOD." A rating of "FAIR" was provided to alternatives that immobilize contaminants, reduce contaminants to less toxic forms, or provide only partial treatment. Treatment alternatives that are reversible or provide no significant reduction in toxicity, mobility, or volume received a rating of "POOR." A rating of "UNACCEPTABLE" was given to technologies which under similar circumstances increased the toxicity, mobility, or volume of contaminants.
- Short-term effectiveness – evaluates potential risks to the public, remediation workers, and the environment during implementation of the remedy. The duration of remedial activities is also considered. Alternatives with minimal intrusive site work received a rating of "GOOD" for short-term effectiveness. Alternatives that pose short-term risks that can be effectively managed received a rating of "FAIR." Alternatives received a rating of "POOR" if they present significant short-term risks and the ability to fully control these risks is uncertain. In general, alternatives that include bringing partially treated or untreated contaminants to the surface received a rating of "FAIR" if potential exposures are short and easily controlled. If contaminants are brought to the surface over a long period of time and exposures are difficult to control, a rating of "POOR" was

given to the alternative. A rating of "UNACCEPTABLE" is given to technologies that, despite implementation of control technologies, would still present unacceptable risks to receptors.

- Implementability – considers potential obstacles to construction of the remedy at the site. The availability of personnel and equipment to implement the remedy is considered, as is the need for permits and the likelihood of obtaining regulatory approvals. Site owner acceptance of the alternative is also a key issue. The expected effectiveness and ability to monitor the effectiveness of the alternative are also considered. Alternatives that are known to have been successfully implemented at similar sites receive a rating of "GOOD." Alternatives that are likely to be implemented successfully, but where uncertainty exists in terms of effectiveness, ability to confirm treatment, or require extensive permitting received a rating of "FAIR." A "POOR" rating was given to alternatives that are expected to be difficult to implement. A rating of "UNACCEPTABLE" is given to alternatives that are not possible to implement.
- Cost – provides an estimate of the capital and operational costs for the alternatives for reference and comparison. Summary sheets providing the basis for the cost estimates are included in Appendix D of this document.

The final criterion, community acceptance, will be evaluated at a later date as part of the public hearing required by the Citizen Participation Plan.

Each of the proposed alternatives is described below, and evaluated in terms of the above criteria as well as the site-specific remedial goal, i.e., eliminating potential exposure pathways for users of the property, and removing sources of MGP contamination to the extent feasible. As required in DER-10, the description of each alternative includes a discussion of its size/configuration, schedule, disposal options, permit requirements and other factors required for evaluation. A summary of the findings from the evaluation is presented in Table 4-2.

4.3 Alternative 1 – NO ACTION

There are no activities associated with the NO ACTION alternative. This option would not have any spatial, disposal or permit requirements. There are also no limitations or other factors necessary to evaluate this alternative.

4.3.1 Remedial Goal Evaluation

4.3.1.1 Elimination of Potential Exposure Pathways

NO ACTION would not change current conditions at the site and therefore, would not eliminate or manage the potential exposure pathways for soil, groundwater or soil gas.

4.3.1.2 Reduction/Mitigation of Contamination

NO ACTION would have no significant effect on the levels of contamination at the site. The only means of contaminant reduction would be via natural attenuation processes. The timeframe for remediation with this alternative is estimated to be more than 100 years for natural processes to degrade constituents of interest at subsurface locations.

4.3.2 Criteria Evaluation

4.3.2.1 Overall Protection of Public Health and the Environment

NO ACTION is rated as "POOR" for overall protection of public health and the environment. Although current site conditions do not pose a significant risk to public health or the environment, NO ACTION would not address the potential risk posed by changes in site conditions or activities.

4.3.2.2 Compliance with Standards, Criteria and Guidance (SCGs)

NO ACTION is rated as "POOR" for this criterion. This alternative does not achieve the remedial goal and does not result in site-wide compliance with the SCGs. NO ACTION would not result in the reduction of contaminant concentrations in soil, groundwater or soil gas other than from the potential effect of natural processes.

4.3.2.3 Long-term Effectiveness and Permanence

NO ACTION is rated "POOR" for this criterion. Since no activity would be conducted to remediate site impacts, contaminants will remain in place with no means to control the potential exposure pathways.

4.3.2.4 Reduction in Toxicity, Mobility and Volume

NO ACTION is rated "POOR" for this criterion. NO ACTION would not result in the reduction of contaminant concentrations or volumes in soil, groundwater or soil gas other than from the potential effect of natural processes.

4.3.2.5 Short-term Effectiveness

NO ACTION is rated "GOOD" for this criterion. This alternative poses no significant potential implementation risks to the public, remediation workers, or the environment as no intrusive site work is proposed

4.3.2.6 Implementability

NO ACTION is rated "GOOD" for this criterion since implementation would require no coordination with property owners and would provide no disruption to residents.

4.3.2.7 Cost

There would be no cost for this alternative.

4.4 Alternative 2 – Institutional Controls

This alternative includes the following:

- Institutional Controls as a legally binding mechanism to appropriately restrict property use, prohibit the use of groundwater and enforce the implementation of a finalized Site Management Plan (SMP). The SMP will require the use of controls to protect workers and the public during intrusive site maintenance activities. Additionally, it will require notification to Con Edison and NYSDEC of changes in site conditions/use, resulting in an evaluation and determination as to whether additional monitoring or remedial activities are required.

4.4.1 Description of Activities

4.4.1.1 Institutional Controls

The optimization of the current site management practices will include the use of Institutional Controls to meet the NYSDEC requirement for Restricted Residential Use (Part 375-1.8 (g)(2)(i), i.e., general prohibition of vegetable gardens, single family housing, and public recreation having a reasonable potential for contact with MGP impacted soil; prohibit the use of groundwater and installation of pumping wells; and ensure the implementation of the SMP at the East 17th Street site in required situations to eliminate potential exposure pathways for construction workers, residents and the general public. The SMP will place restrictions and requirements on the methods used during excavation or management of soil and/or groundwater and soil gas during indoor work. The SMP will provide protection for the public, site workers, and the environment during invasive site work and is designed to eliminate the exposure pathway of soils, groundwater and associated soil gas. When invasive site work is conducted, the SMP will provide support and guidance for utility and maintenance workers that will conduct any utility repairs, fence repairs, tree planting, construction, etc., within the property boundaries below a depth of four feet or below a concrete foundation or slab in site buildings. As stated above, the SMP will also require notification to Con Edison and NYSDEC of a change in site conditions or use of the site. At that time, it will be determined if additional monitoring or remedial activities will be required. Note, however, that specific requirements of any Institutional Controls will require the review and approval of the property owner.

4.4.1.2 Summary of Remedial Processes

There are no remedial processes associated with the alternative. It is anticipated that the development of the SMP and implementation of Institutional Controls at the site would be completed in 3-6 months.

4.4.2 Remedial Goal Evaluation

4.4.2.1 Elimination of Potential Exposure Pathways

Institutional Controls will control soil, groundwater and soil gas exposure pathways for existing conditions, and require a notification to Con Edison and NYSDEC of a change in site conditions/use so that a determination can be made regarding the need to conduct additional monitoring or remedial activities.

4.4.2.2 Reduction/Mitigation of Contamination

The Institutional Controls alternative would likely have little effect on the site-wide levels of contamination. The timeframe for remediation with this alternative is estimated to be more than 100 years for natural processes to degrade constituents of interest at on-site locations.

4.4.3 Criteria Evaluation

4.4.3.1 Overall Protection of Public Health and the Environment

The Institutional Controls alternative is rated “FAIR” for the overall protection of public health and the environment. This alternative maintains the current condition of no significant risk through the implementation of legally enforceable Institutional Controls that prohibit the use of groundwater, and require the use of protective management practices for soil, groundwater and soil gas during intrusive work, or as a result of a change in site conditions/use.

4.4.3.2 Compliance with Standards, Criteria and Guidance (SCGs)

Institutional Controls is rated "FAIR" since it meets the majority of remedial goals and SCGs. Legally enforceable institutional controls would address the potentially complete risk pathways, and in, accordance with NYSDEC Part 375-6.5 (a)(1)(ii), would reduce the number of potential exceedances of criteria by eliminating the requirement to consider soil cleanup objectives for the protection of groundwater.

4.4.3.3 Long-term Effectiveness and Permanence

The alternative is rated "FAIR" for long-term effectiveness and permanence. Although contamination will remain in place, exposure will be effectively controlled due to the legally enforceable nature of the Institutional Controls.

4.4.3.4 Reduction in Toxicity, Mobility and Volume

The alternative is rated "POOR" for this criteria since there will be no active removal/treatment of impacted media.

4.4.3.5 Short-term Effectiveness

Institutional Controls is rated "GOOD" for short-term effectiveness. This alternative incorporates only minimally intrusive activities, e.g., indoor air monitoring, with no short-term risks.

4.4.3.6 Implementability

The alternative is rated "GOOD" for this criterion since it requires only modest modification to the approach that is currently being used at the site. Note that the use of Institutional Controls will require agreement from the owner of the property.

4.4.3.7 Cost

The costs for the Institutional Controls alternative is estimated to be $150,000, to reflect costs for the preparation of the SMP and legal costs for the implementation of the Institutional Controls on the property.

4.5 Alternative 3 – Institutional Controls and Soil Removal

This alternative includes the following:

- Institutional Controls as a legally binding mechanism to appropriately restrict property use, prohibit the use of groundwater and enforce the implementation of a finalized Site Management Plan (SMP). The SMP will require the use of controls to protect workers and the public during intrusive site maintenance activities. Additionally, it will require notification to Con Edison and NYSDEC of changes in site conditions/use, resulting in an evaluation and determination as to whether additional monitoring or remedial activities are required.
- Removal of 400 c.y. of impacted soil in the vadose zone from accessible areas of the site (Figure 4-1) to minimize the direct contact risk to construction workers.

4.5.1 Description of Activities

4.5.1.1 Institutional Controls

Descriptions of the proposed Institutional Controls were discussed previously in Section 4.4.1.1.

4.5.1.2 Removal of Impacted Soil from the Vadose Zone

Excavation and off-site disposal of vadose zone soil in accessible areas would consist of the following basic elements: site preparation, excavation shoring (trench boxes), excavation of impacted soils, loading, transport/disposal of impacted soil, backfilling, and site restoration. Each of these elements is discussed in the paragraphs that follow.

The evaluation of excavation considers the removal of the soil from the initial level of MGP impacts (5 ft bgs) to a depth of approximately 8 ft bgs in accessible areas of the site to address the potential direct contact risk to construction workers. Site preparation activities would include erecting fencing, setting up site trailers, erosion controls, soil stockpile areas, soil loading areas, decontamination stations, and baseline air monitoring. Soil removal in open areas would be conducted using conventional excavation equipment, while soil immediately adjacent to utility lines would be removed using an air knife and vacuum truck.

Measures to mitigate odor, noise, and dust during excavation would be deployed, and a fenceline monitoring program would be used to identify any potential vapor/particulate impacts to the public, so controls could be employed. Contaminated soil would be placed in lined and covered stockpile areas or loaded directly into trucks for subsequent transport off-site.

Excavated soils would be sent to a permitted off-site landfill or thermal desorption facility. Waste characterization sampling would be conducted. Documentation would include waste profile sheets and waste manifests. Soils would be loaded on site into trucks. Trucks would be inspected, decontaminated as necessary, and covered prior to leaving the site.

Once the excavation depth is reached, the excavation would be backfilled using common borrow from a clean off-site source. Site restoration would begin with final grading of the site, removal of remediation support equipment/facilities, and restoration of paved roads, walkways, grass areas, trees, and other site features.

4.5.1.3 Summary of Remedial Processes

Excavation is the remedial activity included in Alternative 3.

1. Size and configuration of process options: Excavation - approximately 400 c.y of MGP-impacted soil would be removed from accessible site areas. Fencing, site trailers, erosion controls and soil stockpile areas would require placement, and trench boxes would be used for shoring. Soil stockpile and equipment decontamination areas would be needed. Approximately 20 truckloads of soil would be removed.
2. Time for remediation: Excavation, site restoration and implementation of Institutional Controls would require up to 9 months to complete.
3. Spatial requirements: The estimated excavation area is approximately 3,600 square feet. Additional space would be necessary for soil stockpiles, heavy equipment staging, etc.

4. Options for disposal: On-site treatment of the excavated soil would not be feasible. Off-site disposal would primarily be at a thermal desorption facility. Wastes that do not meet the size requirements (greater than 3 in. diameter) would be disposed at a landfill permitted to handle MGP wastes.
5. Permit requirements: The excavation would require construction permits.
6. Limitations or other factors necessary to evaluate the alternative: None.

4.5.2 Remedial Goal Evaluation

4.5.2.1 Elimination of Potential Exposure Pathways

The alternative would address the potential risk through proactive remediation (removal of impacted soil from accessible areas of the vadose zone), and institutional controls that: ensure safe work practices and use of measures to protect residents/general public for construction work conducted beneath/ immediately adjacent to site buildings; restrict the use of groundwater; and require a notification to Con Edison and NYSDEC of a change in site conditions/use so that a determination can be made regarding the need to conduct additional monitoring or remedial activities.

4.5.2.2 Reduction/Mitigation of Contamination

The alternative would remove impacts from the accessible areas of the vadose zone.

4.5.3 Criteria Evaluation

4.5.3.1 Overall Protection of Public Health and the Environment

Institutional Controls and Soil Removal is rated as "FAIR" for overall protection of public health and the environment. This alternative maintains the current condition of no significant risk by removing impacted soil from the vadose zone in accessible areas of the site. Additionally, the alternative will control potential risk through the implementation of legally enforceable Institutional Controls that prohibit the use of groundwater, and require the use of protective management practices for soil, groundwater and soil gas during intrusive work, or as a result of a change in site conditions/use.

4.5.3.2 Compliance with SCGs

The alternative is rated "FAIR" for compliance with the SCGs. Soil removal in the vadose zone would increase compliance with direct contact criteria for soil. Legally enforceable institutional controls would address the potentially complete risk pathways and eliminate the requirement to consider soil cleanup objectives for the protection of groundwater when evaluating soil impacts.

4.5.3.3 Long-term Effectiveness and Permanence

The alternative is rated as "FAIR" for this criterion due to the legally binding nature of the deed restrictions and the removal of vadose zone impacts in accessible areas.

4.5.3.4 Reduction of Toxicity, Mobility, or Volume with Treatment

Institutional Controls and Soil Removal is rated as "POOR" for this criterion. This alternative would result in limited removal of contamination (up to approximately 5%) in on-site areas.

4.5.3.5 Short-term Effectiveness

The alternative is rated as "FAIR" for this criterion. It poses potential risks to the public and remediation workers during excavation activities. Impacted soils will be stockpiled at the surface, potentially resulting in fugitive emissions (i.e., dust and odor).

4.5.3.6 Implementability

The alternative is rated as "FAIR" for this criterion. Soil excavations would disrupt site activities and limit building access. Institutional controls would need to be approved by the site owners.

4.5.3.7 Cost

The capital cost for Institutional Controls and Soil Removal is estimated to be $1,030,000 (Table D-1).They include $880,000 for the excavation and disposal of 400 c.y. of MGP-impacted soil; and $150,000 for the development of an SMP and legal costs for the implementation of the Institutional Controls.

4.6 Alternative 4 – Institutional Controls, Soil Removal and Source Material Control

This alternative includes the following:

- Institutional Controls as a legally binding mechanism to appropriately restrict property use, prohibit the use of groundwater and enforce the implementation of a finalized Site Management Plan (SMP). The SMP will require the use of controls to protect workers and the public during intrusive site maintenance activities. Additionally, it will require notification to Con Edison and NYSDEC of changes in site conditions/use, resulting in an evaluation and determination as to whether additional monitoring or remedial activities are required.
- Removal of approximately 400 c.y. of impacted soil from the vadose zone.
- Solidification of approximately 5,300 c.y. of impacted soil from the saturated zone in accessible areas of the site (Figure 4-1), and containment of impacted media in inaccessible areas with a barrier wall.

4.6.1 Description of Activities

4.6.1.1 Institutional Controls

The proposed Institutional Controls were discussed previously in Section 4.4.1.1

4.6.1.2 Excavation of Impacted Soil in Accessible Areas of the Site

Excavation and off-site disposal of soil (5-8 ft bgs) in the accessible areas of the site would address the potential direct exposure for construction workers. A description of the activities associated with the excavation/disposal of vadose zone soils was provided previously in Section 4.5.1.2.

4.6.1.3 Solidification of Impacted Soil

In situ solidification (ISS) is a source containment process that uses cement slurry to immobilize the constituents of interest in the soil by decreasing the relative permeability of the impacted media. Jet grout rigs would be used to introduce cement slurry in overlapping columns in the impacted soil interval (8-30 ft bgs) in accessible areas of the site.

ISS would occur in three phases. In the preparation phase, utilities would be relocated and major subsurface obstructions, such as concrete debris and foundations, would be removed as part of the excavation phase discussed in Section 4.5.1.2. In the second phase, impacted soils in the accessible areas would be mixed with the cement slurry and allowed to cure to a solidified mass. The solidification process results in an increase in soil volume, typically ranging from 10 to 30%, with the excess material, or "spoils," typically transported off-site for disposal at a permitted landfill. The third phase would include backfilling of the open excavations with clean fill, and site restoration.

Solidification would produce a monolithic solidified mass to "isolate" the areas of contamination from groundwater flow, and would eliminate mobile NAPL by reducing the organic content of the concentrated impacts below the residual saturation point of the media. However, solidification does not 'remove" contaminants. The approach would not affect the potential direct contact risk to construction workers since, given the low permeability nature of the solidified mass, it is not appropriate for use in areas such as utility line corridors where routine construction activities could be required.

4.6.1.4 Construction of a Barrier Wall

The jet grout equipment would also be used to install a barrier wall in selected areas adjacent to the site buildings to "connect" the solidified areas and contain the MGP impacts located in inaccessible areas of the site. Approximately 200 linear feet of barrier wall would be installed in the depth interval of 15 to 30 ft bgs to contain impacts and improve groundwater quality in the intermediate zone. As in the case of solidification activities, shallow excavation would be conducted in the areas of the wall to clear utilities/ debris and spoils from the process would be removed and managed off-site.

4.6.1.5 Summary of Remedial Processes

Excavation, solidification and barrier wall construction are the remedial processes included in Alternative 4. See Section 4.5.1.4 for the summary associated with excavation. The summary for solidification and barrier wall construction is provided below.

1. Size and configuration of process options: Assembly and operation of an on-site grout plant. Excavation equipment used to remove grout spoils from the treatment areas.
2. Time for Remediation: Up to 12 months.
3. Spatial requirements: Cement slurry would be injected into the impacted soil intervals using multiple overlapping grout columns (3-5 ft on center). Additional space outside of the treatment areas would be required for siting of the grout plant and stockpiles for excavated soil and grout spoils.
4. Options for disposal: Excess grout would be managed off-site at a permitted land disposal facility.
5. Permit requirements: Construction and building permits would be required.
6. Limitations or other factors necessary to evaluate the alternative: A bench-scale study to develop the grout mixture to achieve the appropriate post treatment conditions for the solidified mass and barrier wall, e.g. permeability and unconfined compressive strength.

4.6.2 Remedial Goal Evaluation

4.6.2.1 Elimination of Potential Exposure Pathways

The alternative would address the potential risk pathways through active remediation (removal of impacted soil from accessible areas of the vadose zone) and Institutional Controls that: ensure safe work practices and use of measures to protect residents and the general public for construction work conducted beneath/immediately adjacent to site buildings; restrict the use of groundwater; and require a notification to Con Edison and NYSDEC of a change in site conditions/use so that a determination can be made regarding the need to conduct additional monitoring or remedial activities.

4.6.2.2 Reduction/Mitigation of Contaminants

Excavation has the potential to permanently remove impacted media from accessible areas of the site to a nominal depth of 8 ft bgs. This area is expected to contain <5% of the site-wide soil impacts. Solidification would be used to treat impacts in deeper soil intervals in accessible areas of the site to improve groundwater quality at both on-site and off-site locations.

4.6.3 Criteria Evaluation

4.6.3.1 Overall Protection of Public Health and the Environment

The alternative is rated as "FAIR" for overall protection of public health and the environment. This alternative maintains the current condition of no significant risk by removal of impacted soil from the vadose zone in accessible areas of the site. Additionally, the alternative will control potential risk through the implementation of legally enforceable Institutional Controls that prohibit the use of groundwater, and require the use of protective management practices for soil, groundwater and soil gas during intrusive work, or as a result of a change in site conditions/use.

4.6.3.2 Compliance with Standards, Criteria and Guidance (SCGs)

The alternative is rated "FAIR" for compliance with the SCGs. Soil removal in the vadose zone would increase compliance with direct contact criteria for soil. However, solidification will not improve compliance in deeper soil locations. Legally enforceable institutional controls would address the potentially complete risk pathways and eliminate the requirement to consider soil cleanup objectives for the protection of groundwater when evaluating soil impacts. It is likely that treatment/containment of soil impacts would provide some benefit in groundwater quality, but it is not clear what effect it would have on site-wide compliance with AWQSGVs.

4.6.3.3 Long-term Effectiveness and Permanence

The alternative is rated as "FAIR" for this criterion due to the legally binding nature of the deed restrictions and the permanent nature of excavation and effect of the treatment of vadose zone soil impacts.

4.6.3.4 Reduction of Toxicity, Mobility, or Volume with Treatment

The alternative is rated as "FAIR" for this criterion. This alternative would result in limited to moderate removal/treatment of soil contamination and improve groundwater quality at on-site and off-site locations.

4.6.3.5 Short-term Effectiveness

The alternative is rated as "POOR" for this criterion. This alternative provides the potential to pose risks to the public and remediation workers during excavation and solidification activities. Impacted soils and excess grout will be stockpiled at the surface and this, in addition to general construction activities, may result in fugitive emissions (i.e., dust and odor) over an extended period of time (up to 6-months).

4.6.3.6 Implementability

The alternative is rated as "POOR" for this criterion. The excavation/solidification activities in the areas adjacent to the residential buildings would provide a significant disruption to site activities and limit building access for site residents. Institutional Controls would need to be approved by the site owners.

4.6.3.7 Cost

The capital costs for Institutional Controls, Soil Removal and Source Material Control are estimated to be $5,470,000 (Table D-2). They include $880,000 for the excavation and disposal of 400 c.y. of MGP-impacted soil; $4,040,000 for solidification of 5,300 c.y. of impacted soil below 8 ft bgs; and $400,000 for the construction of 200 linear feet of barrier wall. The development of an SMP and legal costs for the implementation of the Institutional Controls are estimated to cost $150,000.

5.0 Recommended Alternative

Institutional Controls (Alternative 2) is the proposed remedy for the site. This alternative includes:

- Institutional Controls as a legally binding mechanism to appropriately restrict property use, prohibit the use of groundwater and enforce the implementation of a finalized Site Management Plan (SMP). The SMP will require the use of controls to protect workers and the public during intrusive site maintenance activities. Additionally, it will require notification to Con Edison and NYSDEC of changes in site conditions/use, resulting in an evaluation and determination as to whether additional monitoring or remedial activities are required.

A detailed description of the proposed remedy and an analysis of the remedy's compliance with the seven evaluation criteria are discussed in Section 4.4. Alternative 2 was chosen because it eliminates the potential risk from residual MGP impacts with a minimum of disruption to routine site activities and short-term risk to site residents. Additionally, the approach provides sufficient flexibility to adjust to changes in site conditions. Remedial activities would be implemented within a reasonable timeframe and would not require large temporary or permanent spatial considerations. Contaminants will remain in subsurface locations, but legally enforceable institutional controls will be in place, and the SMP will require that additional monitoring or remedial measures be implemented, if required by a change in site conditions or use. Note however, that the formal implementation of Institutional Controls as deed restrictions will require the review and approval of site owners.

5.1 Alternatives Summary

A brief summary is provided below for Alternatives 1, 3 and 4 providing reasons why these were not chosen as the recommended alternative.

Alternative 1 – NO ACTION does not meet the Remedial Goals for the project.

Alternative 3 – Institutional Controls and Soil Removal maintains the conditions of no significant risk and meets the RAOs, with limited contaminant removal. However, the removal of impacted soil from the vadose zone in anticipation of potential future utility/maintenance work would result in the loss of access to areas of the property for an extended period of time. These activities could be un-necessarily disruptive to site residents since future utility work may not be required in the excavation areas.

Alternative 4 – Institutional Controls, Soil Removal and Source Material Control maintains the conditions of no significant risk and meets the RAOs, but with significant disruption to site activities over an extended period of time as well as potential short-term risk to site residents.

6.0 References

ENSR Corporation (2008c), “Draft Interim Remedial Measure Work Plan Indoor Air Sampling,” prepared for Consolidated Edison Company of New York, Inc. November 18, 2008.

ENSR Corporation (2008a), “Interim Remedial Measure Work Plan Nonaqueous Phase Liquid Monitoring and Recovery,” prepared for Consolidated Edison Company of New York, Inc. December, 2008.

ENSR Corporation (2008d), “Interim Site Management Plan for Invasive Activities In and Around Peter Cooper Village and Stuyvesant Town, Manhattan, NY,” prepared for Consolidated Edison Company of New York, Inc. August 2008.

ENSR Corporation (2008d). “Supplemental Remedial Investigation Work Plan, Stuyvesant Town Former Manufactured Gas Plant Sites,” prepared for Consolidated Edison Company of New York, Inc., May 2008.

Environmental Data Resources, Inc. (EDR), 2006, EDR Offsite Receptor Report, Stuyvesant Town, New York, NY, 10009. Inquiry 1772431.1s. October 11.

GEI Consultants, Inc. (2006). “Remedial Investigation Work Plan, Stuyvesant Town Former Manufactured Gas Plant Sites,” prepared for Consolidated Edison Company of New York, Inc., February 2006.

GEI Consultants, Inc. (2007a). “Interim Remedial Investigation Report, Stuyvesant Town Former Manufactured Gas Plant (MGP) Sites,” prepared for Consolidated Edison Company of New York, Inc., September 2007.

GEI Consultants, Inc. (2007b). “Valve Replacement Project Observation Summary Report for the Stuyvesant Town MGP Sites,” prepared for Consolidated Edison Company of New York, Inc., August 2007.

Haley & Aldrich, Inc. (2005). “Site Characterization Report, Former Consolidated Edison Manufactured Gas Plants, Stuyvesant Town Housing Development,” prepared for Consolidated Edison Company of New York, Inc., October 2004, revised April 2005.

Langan Engineering and Environmental Services, P.C. (2003). “MGP Research Report, East 14th Street Works,” prepared for Consolidated Edison Company of New York, Inc., January 19.

Langan Engineering and Environmental Services, P.C. (2002a). “MGP Research Report, East 17th Street Station,” prepared for Consolidated Edison Company of New York, Inc., September 9, 2002.

Langan Engineering and Environmental Services, P.C. (2002b). “MGP Research Report, East 19th Street Station,” prepared for Consolidated Edison Company of New York, Inc., August 30, 2002.

New York State Department of Environmental Conservation. 2010. DER-10 Technical Guidelines for Site Investigation and Remediation. Division of Environmental Remediation, May, 2010.

New York State Department of Environmental Conservation. (2001). New York State Code of Rules and Regulations, 6NYCRR Title 6, Chapter 100, Part 700-705 and Part 925.6.

New York State Department of Health. (2005). Draft Guidance for Evaluating Soil Vapor Intrusion in the State of New York. Center for Environmental Health, Bureau of Environmental Exposure Investigation, February 2005.

NYSDOH Bureau of Environmental Exposure Investigation (BEEI) 2006, and NYSDEC's Program Policy, "Strategy for Evaluating the Potential for Vapor Intrusion at Remedial Sites in New York", October 2006.

The RETEC Group, Inc. (2003). "E.14th Works and E.17th and E.19th Street Stations, Report of Evaluation of Indoor Air and Soil Gas Sampling," prepared for Consolidated Edison Company of New York, Inc., October 7, 2003.

Tables

Table 4-1
East 17th Street Station
Estimated Quantities of Impacted Soil

Zone	Total Quantity (c.y.)	Inaccessible Quantity [1] (c.y.)	Accessible Quantity (c.y.)
Vadose Zone (5'-8' bgs)	700	300	400
Upper Fill (8' - 20' bgs)	2,900	1,200	1,700
Lower Fill/Native Soil (20' - 30' bgs)	6,000	2,400	3,600
Total Impacted Soil	9,600	3,900	5,700

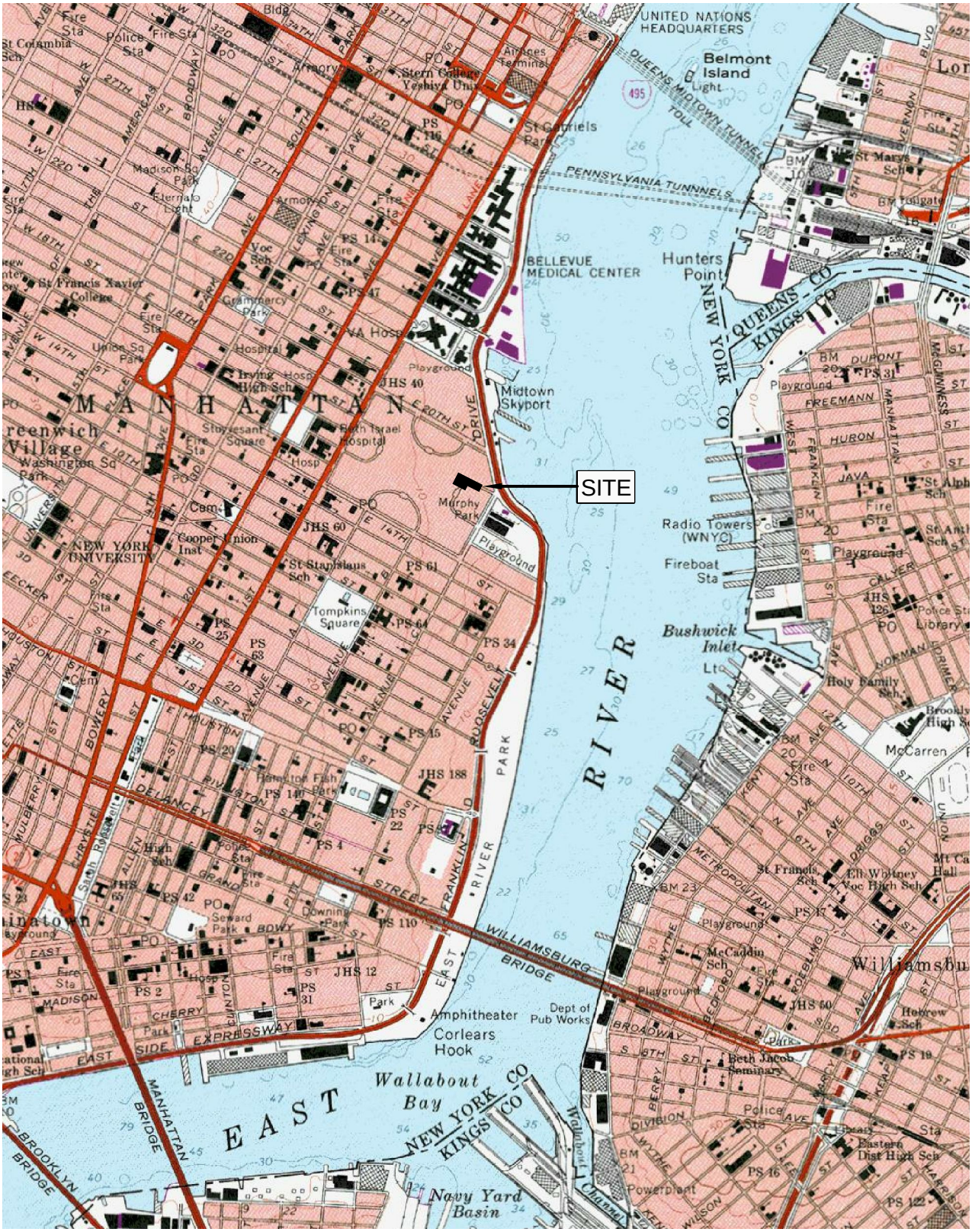
Notes:

[1] Include areas immediately beneath/adjacent to (within 10 ft) residential buildings
bgs = below ground surface

Table 4-2
East 17th Street Station
Alternatives Evaluation

	Objective/Media to be Addressed	1 No Action	2 Institutional Controls	3 Institutional Controls and Soil Removal	4 Institutional Controls , Soil Removal and Source Material Control
Exposure Pathway Elimination		Existing Soil Management Plan (ISMP)	Institutional Controls (site use, excavation, GW use	Institutional Controls (site use, GW use, work under buildings)	Institutional Controls (site use, GW use, work under buildings)
Reduction of Contaminants					
	Impacted Soil	No Activity	No Activity	Excavation (accessible areas of vadose zone (5-8 ft. bgs))	Excavation (accessible areas of vadose zone (5-8 ft. bgs))
	Groundwater	No Activity	No Activity	No Activity	Solidification accessible areas 8-30 ft. bgs, barrier wall to contain impacted
	Soil Gas[1]	No Activity	Site Management Plan	Site Management Plan	Site Management Plan
Evaluation Criteria					
1	Overall Protection of Public Health and Environment	**Poor** - does not address potential risks from	**Fair -** maintains the current condition of no significant risk by legally enforceable	**Fair -** maintains the current condition of no significant risk by removing impacted	**Fair -** maintains the current condition of no significant risk by removing impacted
2	Compliance with Standards, Criteria and Guidance	**Poor** - does not achieve the remedial action	**Fair -** legally enforceable institutional controls address the potentially complete	**Fair -** soil removal in the vadose zone would increase compliance with direct	**Fair -** soil removal in the vadose zone would increase compliance with direct
3	Long-term Effectiveness and Permanence	**Poor** - contaminants will remain in-place with	**Fair -** contamination will remain in place, but exposure will be effectively	**Fair -** contaminants will remain in place but potential risk will be addressed by	**Fair -** contaminants will remain in place, but risk will be addressed by the legally
4	Reduction of Toxicity, Mobility or Volume	**Poor** - provides no significant reduction in contaminant levels	**Poor** - provides no significant reduction in contaminant levels	**Poor -** limited removal of contamination (up to approximately 5%) in on-site areas.	**Fair -** alternative would result in limited to moderate removal/treatment of soil contamination and improve groundwater quality at on-site and off-site locations.
5	Short-term Effectiveness	**Good** - no intrusive site work	Good - no intrusive site work	**Fair -** poses potential risks to residents and workers during excavation activities.	**Poor -** provides the potential to pose risks to the public and remediation workers
6	Implementability	**Good** - currently in place	**Good** - implementable without significant disruption to residents/property.	**Fair -** soil excavations would disrupt site activities and limit building access.	**Poor -** excavation/solidification activities in the areas adjacent to the residential
	Duration				
	Implementation	NA	3-6 months	Up to 9 months	Up to 12 months
7	Estimated Cost	**No Cost**	**$150,000**	**$1,030,000**	**$5,470,000**

Figures



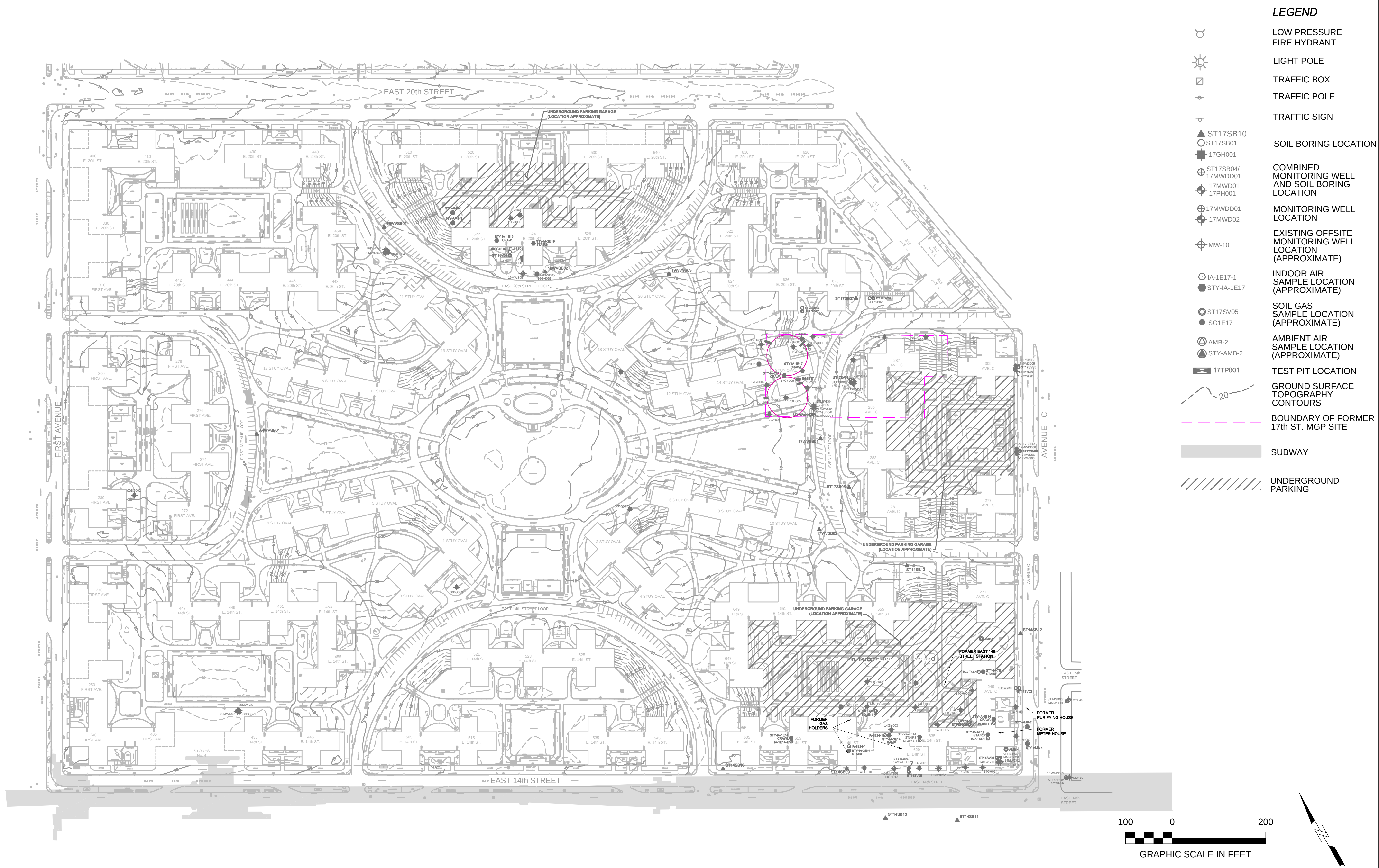
SOURCE:
BROOKLYN QUADRANGLE, NEW YORK – NEW JERSEY, USGS 7.5 MINUTE (TOPOGRAPHIC), DATED 1967, PHOTOREVISED 1981.

0 1000 2000
SCALE IN FEET

AECOM

CONSOLIDATED EDISON OF NEW YORK INC. EAST 17th SREET STATION SITE 60155456.312		SITE LOCATION MAP
DATE: 11/2010	DRWN: RCW/WFD	FIGURE 1-1

File: F:\PROJECTS\Consolidated Edison NY\StyTown\60155456-312\CADD\RASR-17thST\60155456_312-SL-02.dwg Layout: ANSI_AVI-CP User: warrenr Plotted: Nov 04, 2010 - 10:51am Xref's:



AECOM

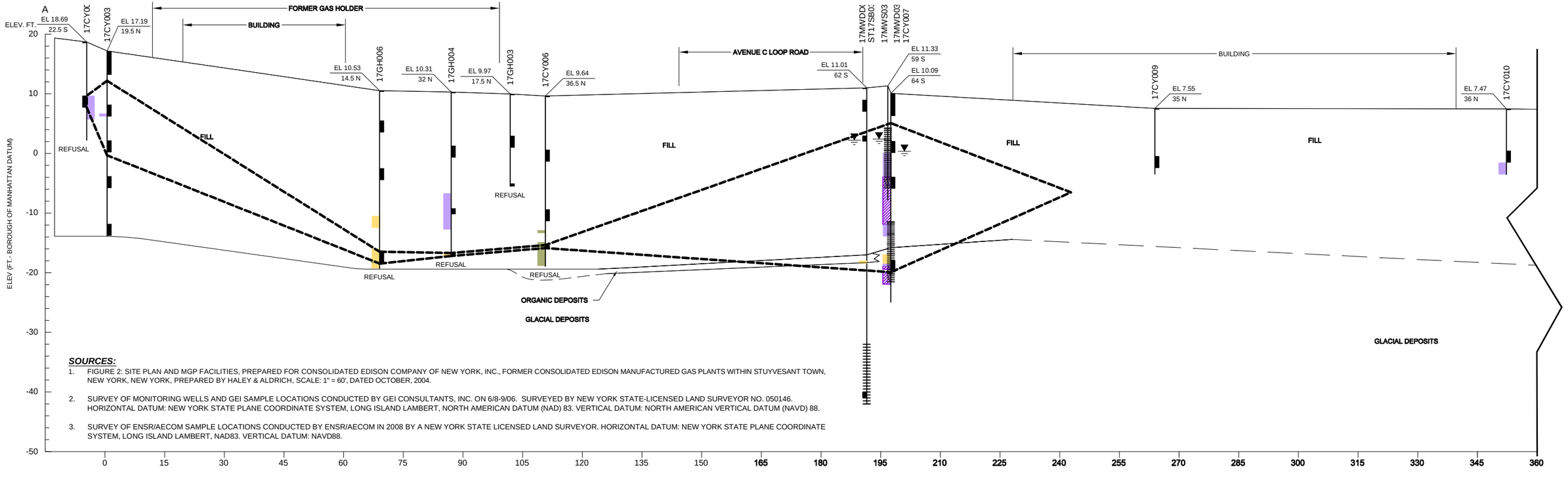
CONSOLIDATED EDISON OF NEW YORK INC.
EAST 17th STREET STATION SITE

60155456.312

DATE: 11/2010 DRWN: RCW/WFD

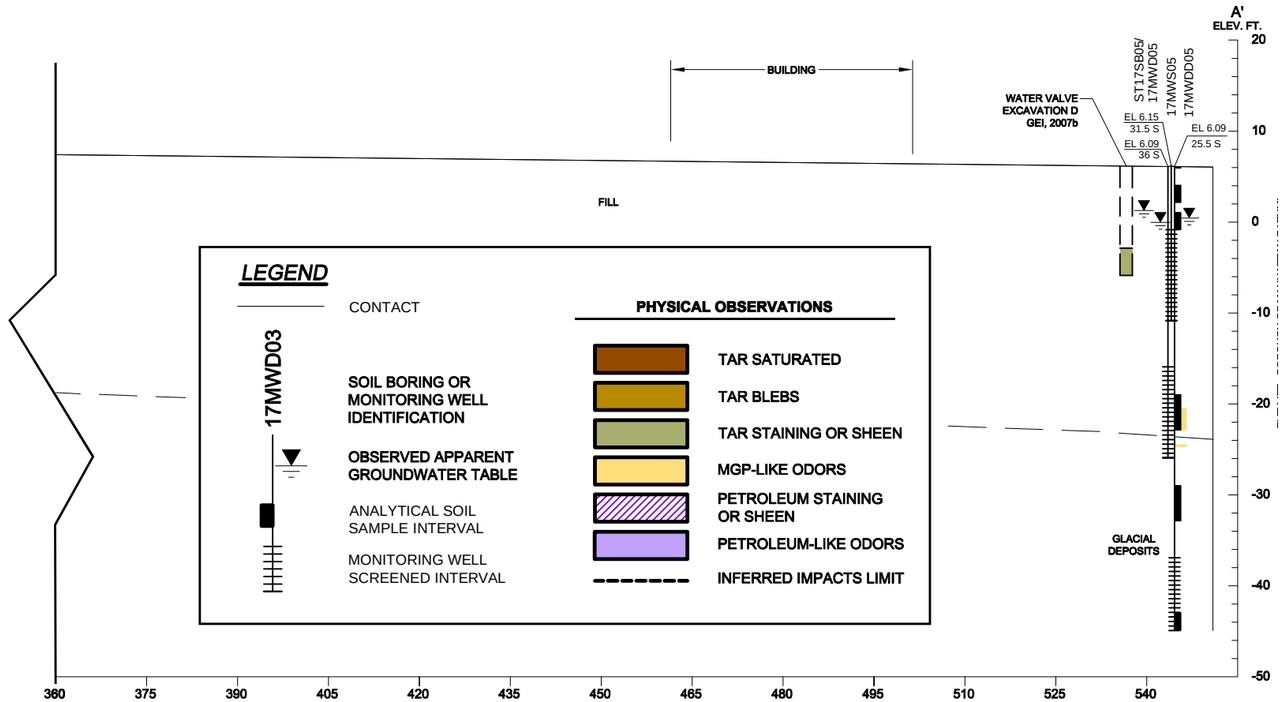
CURRENT SITE LAYOUT AND COMPOSITE HISTORICAL FEATURES

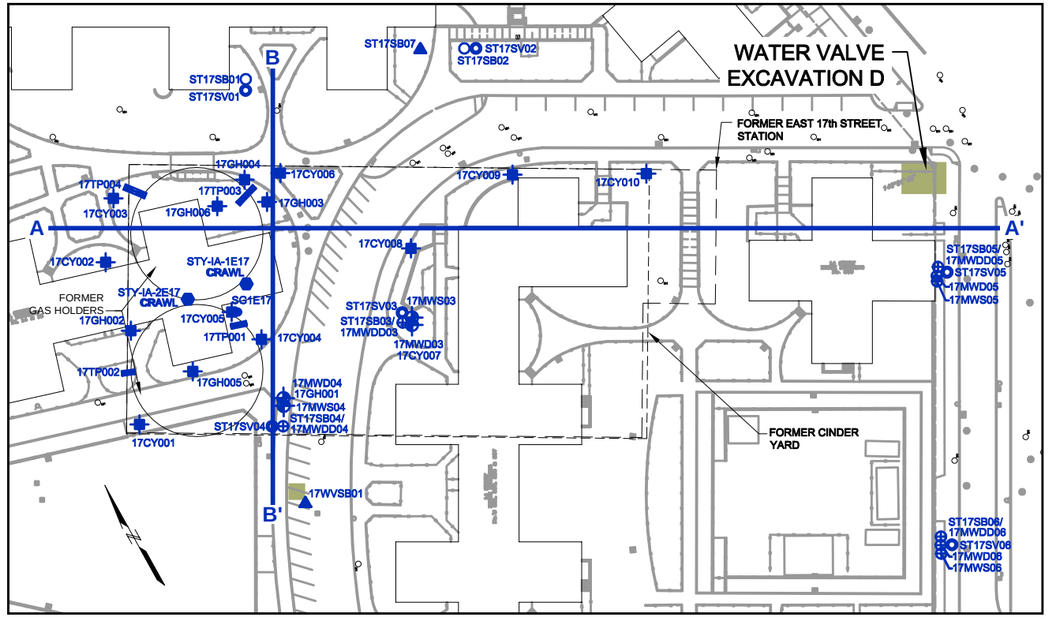
FIGURE 2-1



SOURCES:

1. FIGURE 2: SITE PLAN AND MGP FACILITIES, PREPARED FOR CONSOLIDATED EDISON COMPANY OF NEW YORK, INC., FORMER CONSOLIDATED EDISON MANUFACTURED GAS PLANTS WITHIN STUYVESANT TOWN, NEW YORK, NEW YORK, PREPARED BY HALEY & ALDRICH, SCALE: 1" = 60', DATED OCTOBER, 2004.
2. SURVEY OF MONITORING WELLS AND GEI SAMPLE LOCATIONS CONDUCTED BY GEI CONSULTANTS, INC. ON 6/8-9/06. SURVEYED BY NEW YORK STATE-LICENSED LAND SURVEYOR NO. 050146. HORIZONTAL DATUM: NEW YORK STATE PLANE COORDINATE SYSTEM, LONG ISLAND LAMBERT, NORTH AMERICAN DATUM (NAD) 83. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM (NAVD) 88.
3. SURVEY OF ENSR/AECOM SAMPLE LOCATIONS CONDUCTED BY ENSR/AECOM IN 2008 BY A NEW YORK STATE LICENSED LAND SURVEYOR. HORIZONTAL DATUM: NEW YORK STATE PLANE COORDINATE SYSTEM, LONG ISLAND LAMBERT, NAD83. VERTICAL DATUM: NAVD88.





CROSS SECTION LOCATIONS

AECOM

Consolidated Edison of New York, Inc Stuyvesant Town Former MGP Sites 60155456.312		**EAST 17th STREET STATION** **CROSS SECTION A-A'**
DATE: 11/2010	DRWN: RCW/WFD	**FIGURE 2-2A**

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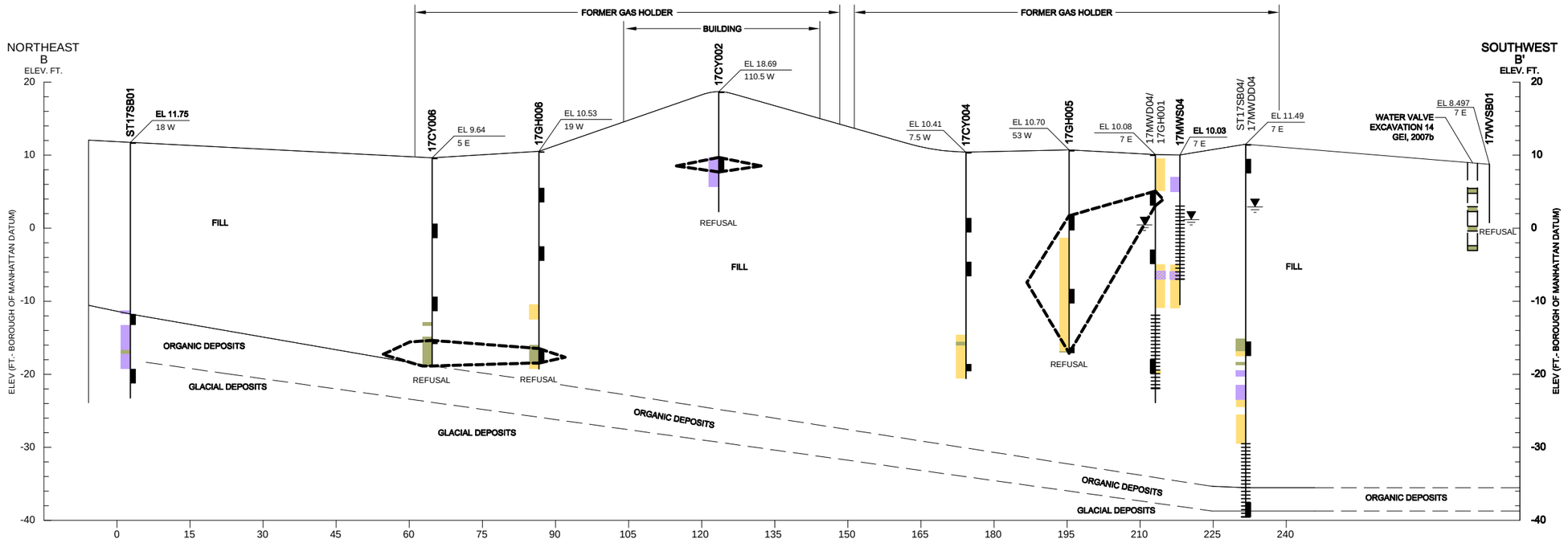

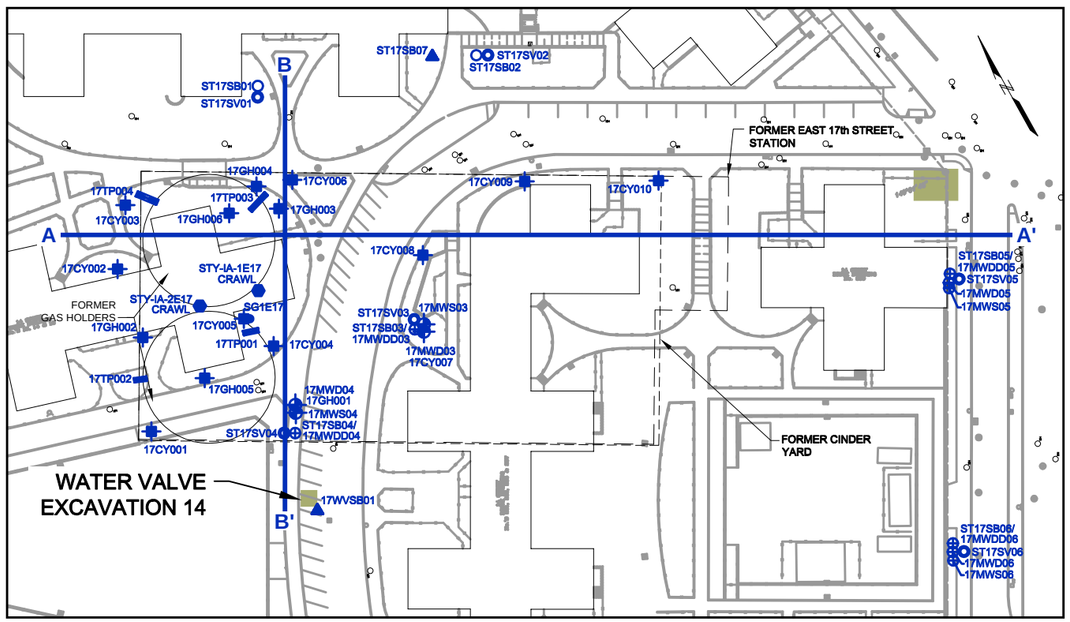

CROSS SECTION LOCATIONS

50 0 100

GRAPHIC SCALE IN FEET

LEGEND

CONTACT

17MWD03

SOIL BORING OR MONITORING WELL IDENTIFICATION

OBSERVED APPARENT GROUNDWATER TABLE

ANALYTICAL SOIL SAMPLE INTERVAL

MONITORING WELL SCREENED INTERVAL

PHYSICAL OBSERVATIONS

- TAR SATURATED
- TAR BLEBS
- TAR STAINING OR SHEEN
- MGP-LIKE ODORS
- PETROLEUM STAINING OR SHEEN
- PETROLEUM-LIKE ODORS
- INFERRED IMPACTS LIMIT

SOURCES:

1. FIGURE 2: SITE PLAN AND MGP FACILITIES, PREPARED FOR CONSOLIDATED EDISON COMPANY OF NEW YORK, INC., FORMER CONSOLIDATED EDISON MANUFACTURED GAS PLANTS WITHIN STUYVESANT TOWN, NEW YORK, NEW YORK, PREPARED BY HALEY & ALDRICH, SCALE: 1" = 60', DATED OCTOBER, 2004.
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3. SURVEY OF ENSR/AECOM SAMPLE LOCATIONS CONDUCTED BY ENSR/AECOM IN 2008 BY A NEW YORK STATE LICENSED LAND SURVEYOR. HORIZONTAL DATUM: NEW YORK STATE PLANE COORDINATE SYSTEM, LONG ISLAND LAMBERT, NAD83. VERTICAL DATUM: NAVD88.

AECOM

Consolidated Edison of New York, Inc
Stuyvesant Town Former MGP Sites
60155456.312

EAST 17th STREET STATION
CROSS SECTION B-B'

DATE: 11/2010 | DRWN: RCW/WFD | **FIGURE 2-2B**

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ST17SB07
ST17SV02
ST17SB02
ST17SB01
ST17SV01
POLLUTION CONTRO
INTERCEPT SEWER
(APPROXIMATE)
FORMER EAST 17th
STREET STATION
MGP STAINING AND
ODOR ~9-12 FT BGS
17GH004
17CY006
17TP004
17TP003
17GH003
17CY003
17GH006
17CY009
17CY010
17CY008
17CY002
STY-IA-1E17
CRAWL
16 STUY OVAL
FORMER
GAS HOLDER
STY-IA-2E17
CRAWL
14 STUY OVAL
SG1E17
17GH002
17CY005
17TP001
17CY004
ST17SV03
17MWS03
ST17SB03/
17MWDD03
17MWD03
17CY007
287
AVE. C
309
AVE. C
ST17SB05/
17MWDD05
ST17SV05
17MWD05
17MWS05
17TP002
17GH005
17MWD04
17GH001
17MWS04
ST17SB04/
17MWDD04
ST17SV04
285
AVE. C
17CY001
FORMER
CINDER YARD
FORMER
GAS HOLDER
MGP STAINING AND
ODOR ~3.5-12 FT BGS
17WVSB01
AVENUE "C" LOOP
ST17SB06/
17MWDD06
ST17SV06
17MWD06
17MWS06
AVENUE C
283
AVE. C
ST17SB08
281
AVE. C
277
AVE. C
8 STUY OVAL
MGP STAINING AND
ODOR ~10-12 FT BGS
10 STUY OVAL
17WVSB02
UNDERGROUND PARKING GARAGE
(LOCATION APPROXIMATE)

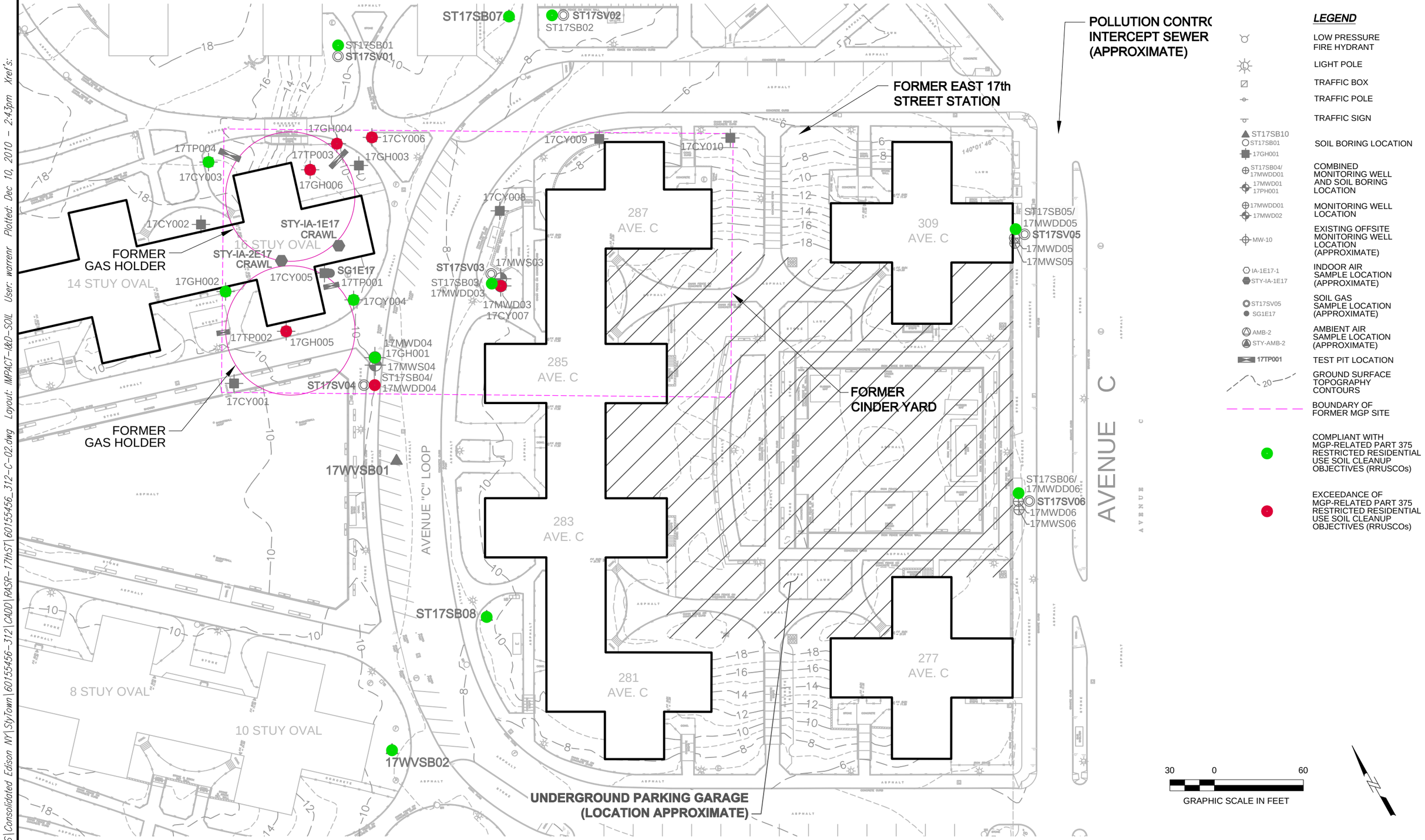
LEGEND

- LOW PRESSURE FIRE HYDRANT
- LIGHT POLE
- TRAFFIC BOX
- TRAFFIC POLE
- TRAFFIC SIGN
- ST17SB10 / ST17SB01 / 17GH001 — SOIL BORING LOCATION
- ST17SB04/17MWDD01 / 17MWD01 / 17PH001 — COMBINED MONITORING WELL AND SOIL BORING LOCATION
- 17MWDD01 / 17MWD02 — MONITORING WELL LOCATION
- MW-10 — EXISTING OFFSITE MONITORING WELL LOCATION (APPROXIMATE)
- IA-1E17-1 / STY-IA-1E17 — INDOOR AIR SAMPLE LOCATION (APPROXIMATE)
- ST17SV05 / SG1E17 — SOIL GAS SAMPLE LOCATION (APPROXIMATE)
- AMB-2 / STY-AMB-2 — AMBIENT AIR SAMPLE LOCATION (APPROXIMATE)
- 17TP001 — TEST PIT LOCATION
- 20 — GROUND SURFACE TOPOGRAPHY CONTOURS
- BOUNDARY OF FORMER MGP SITE
- COMPLIANT WITH MGP-RELATED PART 375 RESTRICTED RESIDENTIAL USE SOIL CLEANUP OBJECTIVES (RRUSCOs)
- EXCEEDANCE OF MGP-RELATED PART 375 RESTRICTED RESIDENTIAL USE SOIL CLEANUP OBJECTIVES (RRUSCOs)
- OBSERVATIONS OF MGP ODOR AND STAINING (GEI, 2007b)

30 0 60
GRAPHIC SCALE IN FEET

AECOM

CONSOLIDATED EDISON OF NEW YORK INC. EAST 17th STREET STATION SITE 60155456.312			**SUMMARY OF MGP IMPACTS SHALLOW SOIL (0.1 TO 17 FT. BGS)**
DATE: 11/2010	DRWN: RCW/WFD		**FIGURE 2-3A**



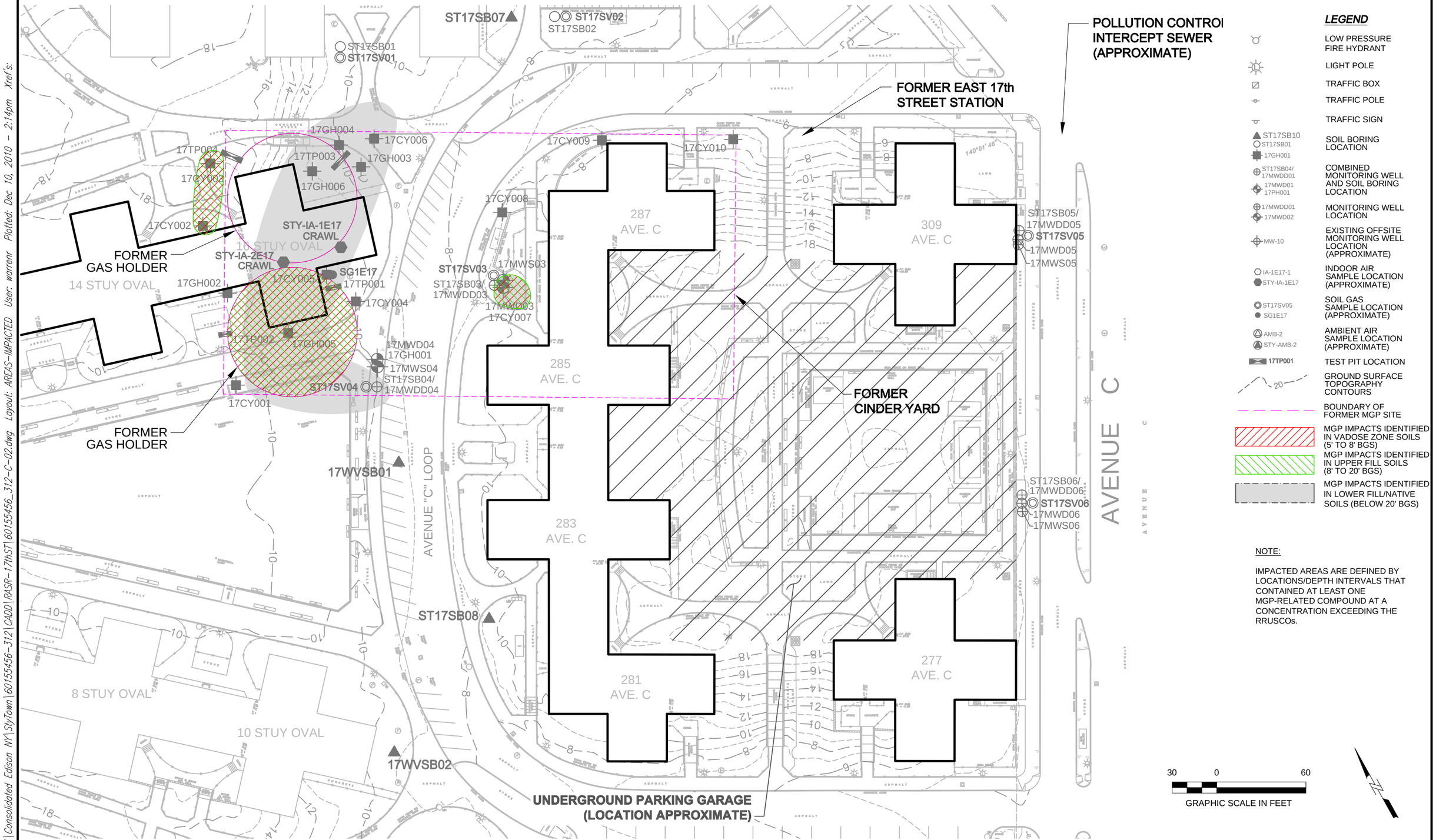
LEGEND

- LOW PRESSURE FIRE HYDRANT
- LIGHT POLE
- TRAFFIC BOX
- TRAFFIC POLE
- TRAFFIC SIGN
- ST17SB10 / ST17SB01 / 17GH001 — SOIL BORING LOCATION
- ST17SB04/17MWDD01 / 17MWD01 / 17PH001 — COMBINED MONITORING WELL AND SOIL BORING LOCATION
- 17MWDD01 / 17MWD02 — MONITORING WELL LOCATION
- MW-10 — EXISTING OFFSITE MONITORING WELL LOCATION (APPROXIMATE)
- IA-1E17-1 / STY-IA-1E17 — INDOOR AIR SAMPLE LOCATION (APPROXIMATE)
- ST17SV05 / SG1E17 — SOIL GAS SAMPLE LOCATION (APPROXIMATE)
- AMB-2 / STY-AMB-2 — AMBIENT AIR SAMPLE LOCATION (APPROXIMATE)
- 17TP001 — TEST PIT LOCATION
- 20 — GROUND SURFACE TOPOGRAPHY CONTOURS
- BOUNDARY OF FORMER MGP SITE
- COMPLIANT WITH MGP-RELATED PART 375 RESTRICTED RESIDENTIAL USE SOIL CLEANUP OBJECTIVES (RRUSCOs)
- EXCEEDANCE OF MGP-RELATED PART 375 RESTRICTED RESIDENTIAL USE SOIL CLEANUP OBJECTIVES (RRUSCOs)

AECOM

CONSOLIDATED EDISON OF NEW YORK INC. EAST 17th STREET STATION SITE 60155456.312			**SUMMARY OF MGP IMPACTS INTERMEDIATE/DEEP SOIL (BELOW 17 FT. BGS)**	
DATE: 11/2010	DRWN: RCW/WFD			**FIGURE 2-3B**

File: F:\PROJECTS\Consolidated Edison NY\StyTown\60155456_312\CADD\RASR-17thST\60155456_312-G-02.dwg Layout: IMPACT-I&D-SOIL User: warrenr Plotted: Dec 10, 2010 - 2:43pm Xref's:



LEGEND

- LOW PRESSURE FIRE HYDRANT
- LIGHT POLE
- TRAFFIC BOX
- TRAFFIC POLE
- TRAFFIC SIGN
- ST17SB10, ST17SB01, 17GH001 — SOIL BORING LOCATION
- ST17SB04/17MWDD01, 17MWD01, 17PH001 — COMBINED MONITORING WELL AND SOIL BORING LOCATION
- 17MWDD01, 17MWD02 — MONITORING WELL LOCATION
- MW-10 — EXISTING OFFSITE MONITORING WELL LOCATION (APPROXIMATE)
- IA-1E17-1, STY-IA-1E17 — INDOOR AIR SAMPLE LOCATION (APPROXIMATE)
- ST17SV05, SG1E17 — SOIL GAS SAMPLE LOCATION (APPROXIMATE)
- AMB-2, STY-AMB-2 — AMBIENT AIR SAMPLE LOCATION (APPROXIMATE)
- 17TP001 — TEST PIT LOCATION
- 20 — GROUND SURFACE TOPOGRAPHY CONTOURS
- BOUNDARY OF FORMER MGP SITE
- MGP IMPACTS IDENTIFIED IN VADOSE ZONE SOILS (5' TO 8' BGS)
- MGP IMPACTS IDENTIFIED IN UPPER FILL SOILS (8' TO 20' BGS)
- MGP IMPACTS IDENTIFIED IN LOWER FILL/NATIVE SOILS (BELOW 20' BGS)

NOTE:

IMPACTED AREAS ARE DEFINED BY LOCATIONS/DEPTH INTERVALS THAT CONTAINED AT LEAST ONE MGP-RELATED COMPOUND AT A CONCENTRATION EXCEEDING THE RRUSCOs.

30 0 60

GRAPHIC SCALE IN FEET

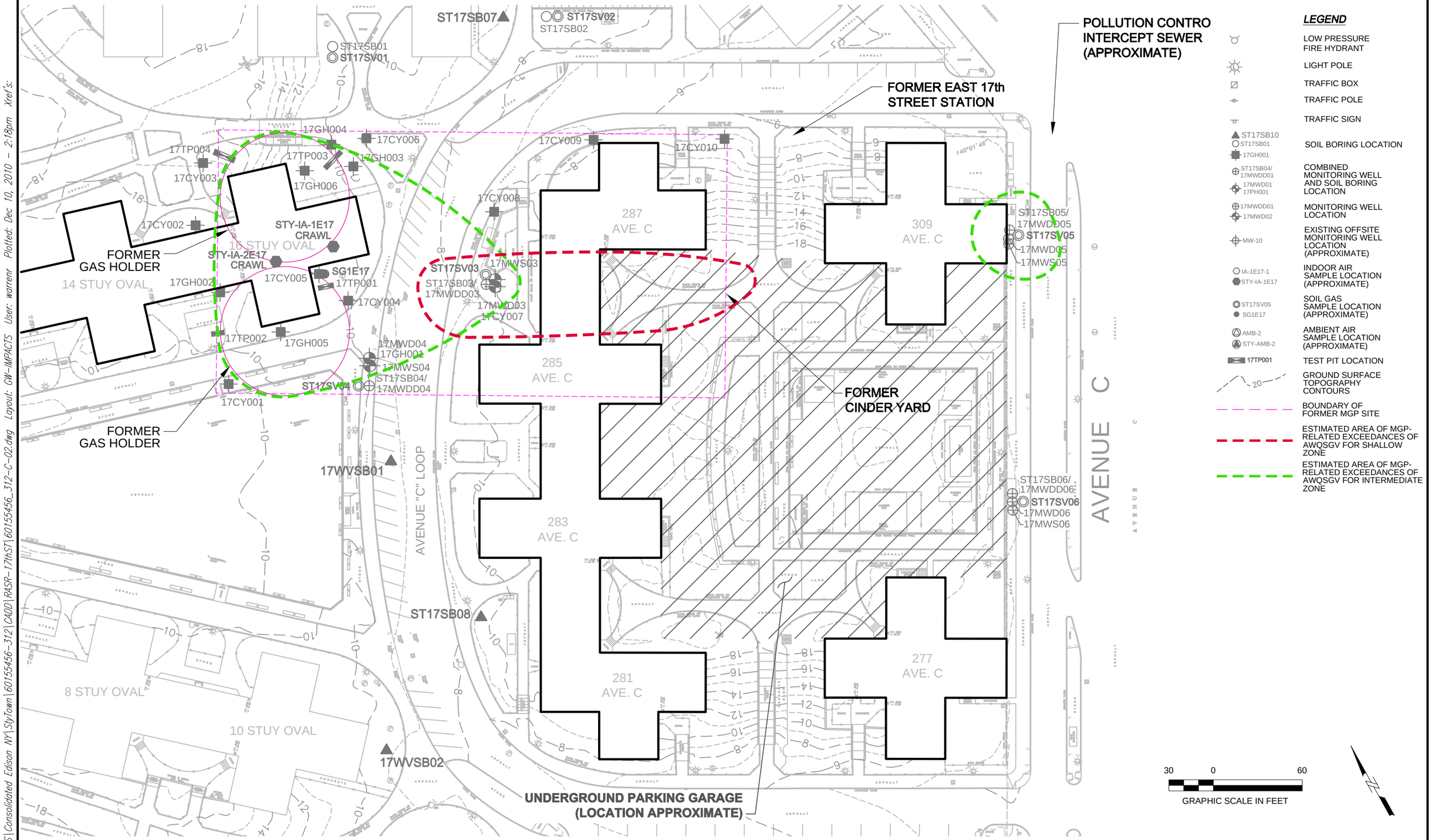
AECOM

CONSOLIDATED EDISON OF NEW YORK INC.
EAST 17th STREET STATION SITE
60155456.312

ESTIMATE OF AREAS IMPACTED BY MGP RESIDUALS IN SOIL

DATE: 11/2010 | DRWN: RCW/WFD | **FIGURE 4-1**

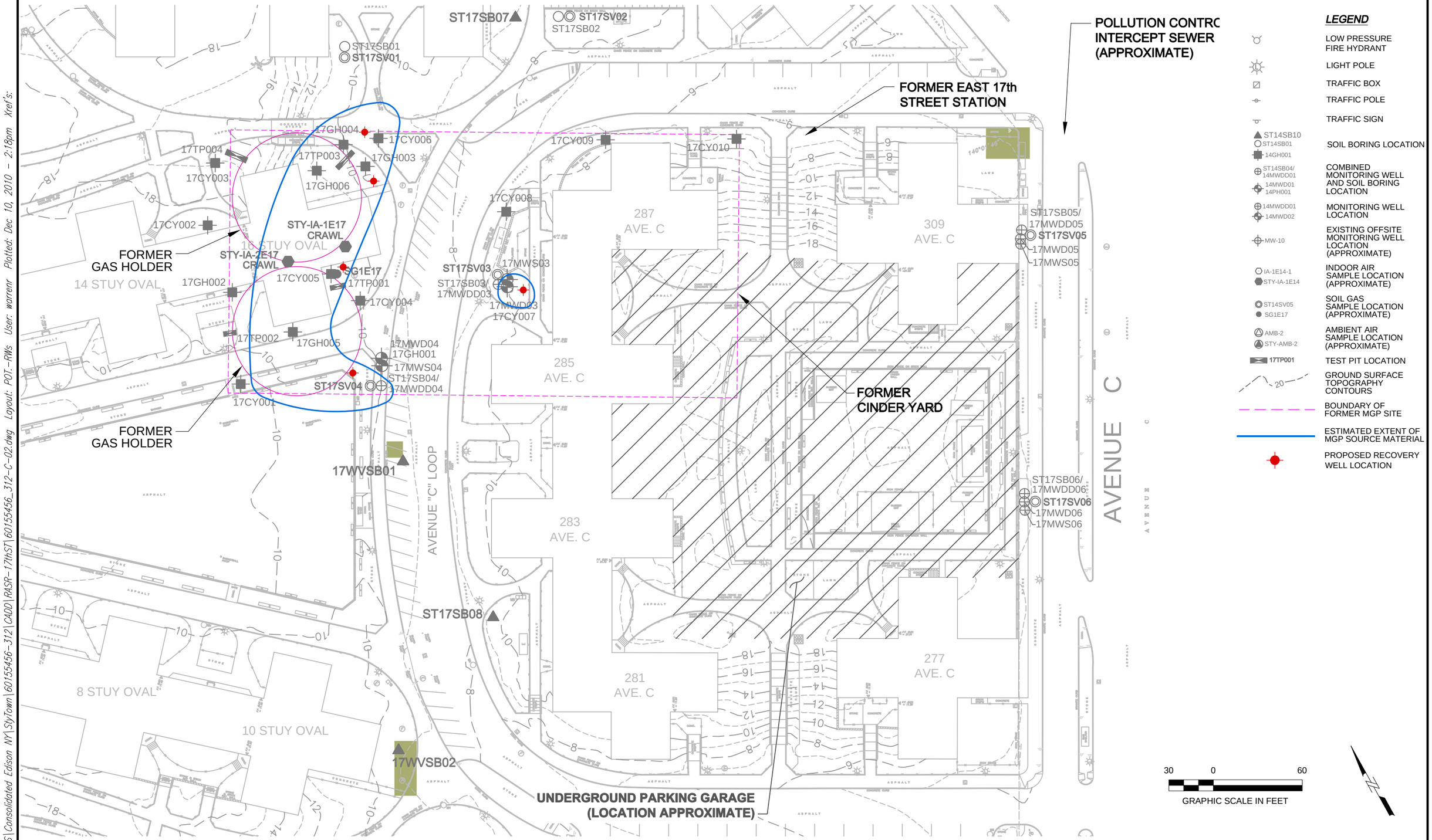
File: F:\PROJECTS\Consolidated Edison NY\SiyTown\60155456-312\CADD\RASR-17thST\60155456_312-C-02.dwg Layout: AREAS-IMPACTED User: warrenr Plotted: Dec 10, 2010 - 2:14pm Xref's:



File: F:\PROJECTS\Consolidated Edison NY\SiyTown\60155456-312\CADD\RASR-17thST\60155456_312-C-02.dwg Layout: GW-IMPACTS User: warrenr Plotted: Dec 10, 2010 - 2:18pm Xref's:

AECOM

CONSOLIDATED EDISON OF NEW YORK INC. EAST 17th STREET STATION SITE 60155456.312			**ESTIMATED EXTENT OF GROUNDWATER IMPACTS (2008) FOR PRINCIPAL MGP CONSTITUENTS (BTEX AND NAPHTHALENE)**
DATE: 11/2010	DRWN: RCW/WFD		**FIGURE 4-2**



LEGEND

- LOW PRESSURE FIRE HYDRANT
- LIGHT POLE
- TRAFFIC BOX
- TRAFFIC POLE
- TRAFFIC SIGN
- ST14SB10 / ST14SB01 / 14GH001 — SOIL BORING LOCATION
- ST14SB04/14MWDD01 / 14MWD01 / 14PH001 — COMBINED MONITORING WELL AND SOIL BORING LOCATION
- 14MWDD01 / 14MWD02 — MONITORING WELL LOCATION
- MW-10 — EXISTING OFFSITE MONITORING WELL LOCATION (APPROXIMATE)
- IA-1E14-1 / STY-IA-1E14 — INDOOR AIR SAMPLE LOCATION (APPROXIMATE)
- ST14SV05 / SG1E17 — SOIL GAS SAMPLE LOCATION (APPROXIMATE)
- AMB-2 / STY-AMB-2 — AMBIENT AIR SAMPLE LOCATION (APPROXIMATE)
- 17TP001 — TEST PIT LOCATION
- 20 — GROUND SURFACE TOPOGRAPHY CONTOURS
- BOUNDARY OF FORMER MGP SITE
- ESTIMATED EXTENT OF MGP SOURCE MATERIAL
- PROPOSED RECOVERY WELL LOCATION

30 0 60

GRAPHIC SCALE IN FEET

AECOM

CONSOLIDATED EDISON OF NEW YORK INC. EAST 17th STREET STATION SITE 60155456.312			**POTENTIAL LOCATIONS FOR RECOVERY WELLS**
DATE: 11/2010	DRWN: RCW/WFD		**FIGURE 5-1**

File: F:\PROJECTS\Consolidated Edison NY\StyTown\60155456-312\CADD\RASR-17thST\60155456_312-C-02.dwg Layout: POI-RWs User: warrenr Plotted: Dec 10, 2010 - 2:18pm Xref's:

Appendix A

Summary of Soil Results

Table A-1
Summary of Soil Analytical Data
East 17th Street Station Site
Shallow Soils
(0.1 - 17 ft bgs)

Location ID Sample Date Sample ID depth Interval	ST-NYSDEC Part 375-6 Restricted-Res	17CY001 2/4/2004 17CY001(0-2)020404 0-2	17CY001 2/4/2004 17CY001(2-4)020404 2-4	17CY001 2/11/2004 17CY001(9-11)021104 9-11	17CY002 2/25/2004 17CY002(9-11)022504 9-11	17CY003 2/5/2004 17CY003(0-2)020504 0-2	17CY003 2/5/2004 17CY003(2-4)020504 2-4	17CY003 2/26/2004 17CY003(9-11)022604 9-11	17CY003 2/26/2004 17CY003(15-17)022604 15-17	17CY004 2/13/2004 17CY004(9-11)021304 9-11	17CY004 2/13/2004 17CY004(15-17)021304 15-17	17CY005 3/3/2004 17CY005(9-11)030304 9-11
BTEX (mg/Kg)												
Benzene	4.8	NS	NS	NS	**0.042**	NS	NS	**0.0043**	**0.0014**	**0.0008 J**	0.00028 U	NS
Ethylbenzene	41	NS	NS	NS	0.00023 U	NS	NS	0.00021 U	0.00022 U	0.00022 U	**0.0008 J**	NS
Toluene	100	NS	NS	NS	**0.003 J**	NS	NS	**0.002 J**	**0.0024 J**	0.0018 U	0.0027 U	NS
Xylene (Total)	100	NS	NS	NS	0.00057 U	NS	NS	**0.0017 J**	0.00053 U	0.00054 U	**0.004 J**	NS
Total BTEX		NS	NS	NS	**0.045**	NS	NS	**0.008**	**0.0038**	**0.0008**	**0.0048**	NS
VOC (mg/Kg)												
1,2-Dichloroethane	3.1	NS	NS	NS	0.00019 U	NS	NS	0.00017 U	0.00018 U	0.00018 U	0.0002 U	NS
2-Butanone (Methyl Ethyl Ketone)	100	NS	NS	NS	0.0012 U	NS	NS	0 R	**0.011 J**	0.0011 U	0.0012 U	NS
Acetone	100	NS	NS	NS	0.0028 UJ	NS	NS	**0.064 J**	**0.036 J**	**0.044**	**0.074**	NS
Carbon Disulfide		NS	NS	NS	0.00035 U	NS	NS	**0.0023 J**	**0.0006 J**	0.00034 U	**0.0009 J**	NS
Chloroform	49	NS	NS	NS	0.00027 U	NS	NS	0.00024 U	0.00025 U	0.00026 U	0.00028 U	NS
Methylene Chloride	100	NS	NS	NS	0.00027 U	NS	NS	0.044 U	0.0009 U	0.0014 U	0.0009 U	NS
Trichloroethene	21	NS	NS	NS	0.00032 U	NS	NS	**0.0041**	0.0003 U	0.0003 U	0.00032 U	NS
Total VOC		NS	NS	NS	**0.045**	NS	NS	**0.0784**	**0.0514**	**0.0448**	**0.0797**	NS
VOC TICs (mg/kg)												
Total VOC TICs								**0.0556**	**0.0163**		**0.16**	
PAH (mg/Kg)												
2-Methylnaphthalene	NS	**0.031 J**	**0.01 J**	NS	**4**	**0.026 J**	**0.19 J**	**0.12 J**	**0.33 J**	0.037 U	0.02 U	NS
Acenaphthene	100	**0.07 J**	**0.042 J**	NS	**2.5 J**	**0.025 J**	**0.53 J**	**0.28 J**	**0.37 J**	**0.034 J**	**0.0094 J**	NS
Acenaphthylene	100	**0.77**	**0.051 J**	NS	**8.7**	**0.22 J**	**0.66 J**	**0.36 J**	**2.8**	**0.1 J**	**0.021 J**	NS
Anthracene	100	**0.47**	**0.13 J**	NS	**7.5**	**0.11 J**	**2.4**	**0.86**	**3.8**	**0.13 J**	**0.019 J**	NS
Benzo(a)anthracene	1	**1.4**	**r**	NS	**21**	**0.38**	**5.7**	**2**	**12**	**0.48**	**0.078**	NS
Benzo(a)pyrene	1	**2**	**0.47**	NS	**20**	**0.4**	**5.2**	**1.6 J**	**11**	**0.4**	**0.087**	NS
Benzo(b)fluoranthene	1	**1.9**	**0.39**	NS	**16**	**0.25**	**4.2**	**1.5 J**	**9.4**	**0.44**	**0.065**	NS
Benzo(ghi)perylene	100	**1.6**	**0.31 J**	NS	**12**	**0.23 J**	**2.7**	**0.46 J**	**7.1**	**0.31 J**	**0.058 J**	NS
Benzo(k)fluoranthene	3.9	**2**	**0.44**	NS	**21**	**0.39**	**4.9**	**1.9 J**	**11**	**0.44**	**0.08**	NS
Chrysene	3.9	**1.7**	**0.5**	NS	**25**	**0.39**	**5.4**	**2.2**	**12**	**0.55 J**	**0.08 J**	NS
Dibenz(a,h)anthracene	0.33	**0.14**	**0.1**	NS	**4.3**	**0.022 J**	**0.3**	**0.16 J**	**2.4**	**0.019 J**	0.0028 U	NS
Fluoranthene	100	**2.2**	**1**	NS	**48**	**0.63**	**11**	**3.6**	**17**	**0.94**	**0.1 J**	NS
Fluorene	100	**0.074 J**	**0.032 J**	NS	**5**	**0.024 J**	**0.67 J**	**0.29 J**	**1.2 J**	**0.053 J**	0.0029 U	NS
Indeno(1,2,3-cd)pyrene	0.5	**1.5**	**0.28**	NS	**13**	**0.21**	**2.7**	**0.52 J**	**6.5**	**0.3**	**0.051**	NS
Naphthalene	100	**0.064 J**	**0.019 J**	NS	**5.6**	**0.092 J**	**0.56 J**	**0.18 J**	**0.28 J**	**0.039 J**	**0.027 J**	NS
Phenanthrene	100	**1.3**	**0.56**	NS	**53**	**0.33 J**	**7.9**	**3.4**	**15**	**0.66 J**	**0.058 J**	NS
Pyrene	100	**2.6 J**	**0.92 J**	NS	**44**	**0.68 J**	**10 J**	**4.5**	**20**	**0.88**	**0.17 J**	NS
Total PAH	NS	**19.819**	**5.724**	NS	**310.6**	**4.409**	**65.01**	**23.93**	**132.18**	**5.775**	**0.9034**	NS

Notes:
Bolded values = detected in sample
Yellow highlighted values = exceed ST-NYSDEC Part 375-6 Restricted-Residential
U = Nondetected result. The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit
J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
J+ = (Inorganics) The result is an estimated quantity, but the result may be biased high.
J- = (Inorganics) The result is an estimated quantity, but the result may be biased low.
R = The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet the quality control criteria.
The presence of absence of the analyte cannot be verified.

Table A-1
Summary of Soil Analytical Data
East 17th Street Station Site
Shallow Soils
(0.1 - 17 ft bgs)

Location ID Sample Date Sample ID depth Interval	ST-NYSDEC Part 375-6 Restricted-Res	17CY001 2/4/2004 17CY001(0-2)020404 0-2	17CY001 2/4/2004 17CY001(2-4)020404 2-4	17CY001 2/11/2004 17CY001(9-11)021104 9-11	17CY002 2/25/2004 17CY002(9-11)022504 9-11	17CY003 2/5/2004 17CY003(0-2)020504 0-2	17CY003 2/5/2004 17CY003(2-4)020504 2-4	17CY003 2/26/2004 17CY003(9-11)022604 9-11	17CY003 2/26/2004 17CY003(15-17)022604 15-17	17CY004 2/13/2004 17CY004(9-11)021304 9-11	17CY004 2/13/2004 17CY004(15-17)021304 15-17	17CY005 3/3/2004 17CY005(9-11)030304 9-11
SVOC (mg/Kg)												
1,1-Biphenyl	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
2,4-Dimethylphenol	NS	**0.011 J**	0.034 U	NS	**0.16 J**	0.035 U	0.07 U	0.034 U	0.17 U	0.073 U	0.039 U	NS
2-Methylphenol	100	0.035 U	0.034 U	NS	**0.11 J**	0.034 U	0.069 U	0.034 U	0.16 U	0.072 U	0.038 U	NS
3+4-Methylphenols	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
4-Methylphenol	100	**0.035 J**	0.037 U	NS	**0.38 J**	0.038 U	**0.025 J**	0.037 U	**0.076 J**	0.078 U	0.042 U	NS
4-Nitroaniline	NS	**0.012 J**	0.018 U	NS	0.19 U	0.018 U	0.036 U	0.018 U	0.089 U	0.038 U	0.02 U	NS
Benzaldehyde	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
bis(2-Ethylhexyl) phthalate	NS	0.12 U	0.13 U	NS	0.24 U	0.2 U	0.22 U	**0.1 J**	0.11 U	**0.29 J**	**0.49**	NS
Carbazole	NS	**0.17 J**	**0.047 J**	NS	**5.6**	**0.02 J**	**0.56 J**	**0.32 J**	**0.63 J**	**0.045 J**	0.0031 U	NS
Dibenzofuran	59	**0.048 J**	**0.013 J**	NS	**4.8**	**0.016 J**	**0.4 J**	**0.17 J**	**0.51 J**	**0.033 J**	**0.011 J**	NS
Di-n-butyl phthalate	NS	0.011 U	0.011 U	NS	0.11 U	0.011 U	**0.36 J**	0.011 U	0.052 U	0.023 U	0.012 U	NS
Total SVOC		**20.095**	**5.784**		**321.65**	**4.445**	**66.355**	**24.52**	**133.396**	**6.143**	**1.4044**	
SVOC TICs (mg/kg)												
Total SVOC TICs		**9.43**	**0.34**	NS	**178.5**	**1.1**	**25.9**	**17.78**	**72**	NS	NS	NS
Metals (mg/Kg)												
Aluminum		**4110**	**4820**	**4270**	**6910**	**10500**	**6360**	**6150**	NS	**7420 J**	NS	**8550**
Antimony		0.92 UJ	0.87 UJ	**1.0 J**	0.92 U	0.90 UJ	**0.90 J**	0.87 UJ	NS	1.4 U	NS	1.3 U
Arsenic	16	**4.6 J**	**2.7 J**	**2.7**	**11.1**	**5.4 J**	**5.9**	**3.1 J**	NS	**5**	NS	**3.1**
Barium	400	**272**	**152**	**146**	**407**	**90.6**	**757**	**184**	NS	**106**	NS	**217**
Beryllium	72	**0.27 J**	**0.32 J**	**0.22 J**	**0.33 J**	**0.40 J**	**0.34 J**	**0.25 J**	NS	**0.38 J**	NS	**0.31 J**
Cadmium	4.3	**0.21 J**	0.089 U	0.092 U	**0.20 J**	0.092 U	**0.55 J**	**0.13 J**	NS	0.095 U	NS	**0.35 J**
Calcium		**5680 J**	**6720 J**	**5710**	**31200**	**2630 J**	**22500 J**	**18400**	NS	**10900 J**	NS	**7130**
Chromium	180	**10.9**	**12.8**	**16.5**	**12.3**	**22.3**	**19.5**	**11.9**	NS	**13.1 J**	NS	**17.1**
Cobalt		**4.1 J**	**5.1 J**	**3.4 J**	**4.5 J**	**4.7 J**	**6.4 J**	**5.4 J**	NS	**6.5 J**	NS	**10.1 J**
Copper	270	**26.3 J**	**74.1 J**	**28.1**	**38**	**26.9 J**	**39.7 J**	**40**	NS	**27.6**	NS	**41.3**
Iron		**10100**	**11900**	**10800**	**12500**	**16300**	**13100**	**11900**	NS	**16200 J**	NS	**18600**
Lead	400	**420 J**	**211 J**	**258**	**714**	**71.7 J**	**639 J**	**161**	NS	**132 J**	NS	**171**
Magnesium		**1830**	**2130**	**1960**	**3610**	**2170**	**3310**	**6170**	NS	**3020**	NS	**4310**
Manganese	2000	**177 J**	**259 J**	**193**	**265**	**230 J**	**265 J**	**192**	NS	**497**	NS	**156**
Mercury	0.81	**0.40 J**	**0.28 J**	**0.29**	**0.81**	**0.23 J**	**1.1 J**	**0.43**	NS	**1.3**	NS	**0.59**
Nickel	310	**11.8**	**16.5**	**10.4**	**11.5**	**11.2**	**15.1**	**13**	NS	**18.7**	NS	**22.8**
Potassium		**707 J**	**931 J**	**526 J**	**1150**	**557 J**	**1480 J**	**864 J**	NS	**1630**	NS	**3830**
Selenium	180	0.92 U	0.87 U	0.96 U	0.92 U	0.90 U	0.89 U	0.87 U	NS	1.00 U	NS	0.95 U
Silver	180	**0.21 J**	0.16 U	0.32 U	0.17 U	**0.16 J**	**0.16 J**	0.16 U	NS	**0.40 J**	NS	**0.40 J**
Sodium		**97.3 J**	**90.1 J**	90.5 U	**517 J**	**254 J**	**192 J**	**410 J**	NS	**283 J**	NS	**249 J**
Vanadium		**19.6**	**17.8**	**15.3**	**19.4**	**28.2**	**22.6**	**32.1**	NS	**15.7**	NS	**20.1**
Zinc	10000	**179**	**191**	**116**	**289**	**86.8**	**511**	**194**	NS	**132**	NS	**136**
Cyanide (mg/Kg)												
Cyanide, Total	27	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Notes:
Bolded values = detected in sample
Yellow highlighted values = exceed ST-NYSDEC Part 375-6 Restricted-Residential
U = Nondetected result. The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit
J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
J+ = (Inorganics) The result is an estimated quantity, but the result may be biased high.
J- = (Inorganics) The result is an estimated quantity, but the result may be biased low.
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The presence of absence of the analyte cannot be verified.

Table A-1
Summary of Soil Analytical Data
East 17th Street Station Site
Shallow Soils
(0.1 - 17 ft bgs)

Location ID Sample Date Sample ID depth Interval	ST-NYSDEC Part 375-6 Restricted-Res	17CY005 3/3/2004 17CY005 DUP(9-11)030304 9-11	17CY006 3/2/2004 17CY006(9-11)030204 9-11	17CY007 1/29/2004 17CY007(0-2)012904 0-2	17CY007 1/30/2004 17CY007(2-4)013004 2-4	17CY007 2/16/2004 17CY007(8-10)021604 8-10	17CY007 2/16/2004 17CY007(14-16)021604 14-16	17CY008 1/29/2004 17CY008(0-2)012904 0-2	17CY008 1/29/2004 17CY008(2-4)012904 2-4	17CY008 2/9/2004 17CY008(9-11)020904 9-11	17CY009 2/9/2004 17CY009(8-10)020904 8-10	17CY010 2/9/2004 17CY010(7-9)020904 7-9
BTEX (mg/Kg)												
Benzene	4.8	NS	**0.0029**	NS	NS	**0.01**	**0.047**	NS	NS	NS	NS	NS
Ethylbenzene	41	NS	0.00023 U	NS	NS	**0.001 J**	**0.025**	NS	NS	NS	NS	NS
Toluene	100	NS	0.00024 U	NS	NS	**0.0048 J**	**0.0017 J**	NS	NS	NS	NS	NS
Xylene (Total)	100	NS	0.00057 U	NS	NS	**0.0035 J**	**0.0098**	NS	NS	NS	NS	NS
Total BTEX		NS	**0.0029**	NS	NS	**0.0193**	**0.0835**	NS	NS	NS	NS	NS
VOC (mg/Kg)												
1,2-Dichloroethane	3.1	NS	**0.0055**	NS	NS	0.00018 U	0.00018 U	NS	NS	NS	NS	NS
2-Butanone (Methyl Ethyl Ketone)	100	NS	0.0012 U	NS	NS	0.0011 U	0.0011 U	NS	NS	NS	NS	NS
Acetone	100	NS	**0.019 J**	NS	NS	**0.07 J**	**0.04 J**	NS	NS	NS	NS	NS
Carbon Disulfide		NS	**0.0011 J**	NS	NS	**0.0033 J**	**0.0009 J**	NS	NS	NS	NS	NS
Chloroform	49	NS	0.00027 U	NS	NS	0.00026 U	0.00026 U	NS	NS	NS	NS	NS
Methylene Chloride	100	NS	0.0069 U	NS	NS	**0.019 J**	0.0013 U	NS	NS	NS	NS	NS
Trichloroethene	21	NS	**0.0011 J**	NS	NS	0.0003 U	0.0003 U	NS	NS	NS	NS	NS
Total VOC		NS	**0.0296**	NS	NS	**0.1116**	**0.1244**	NS	NS	NS	NS	NS
VOC TICs (mg/kg)												
Total VOC TICs			**0.0068**			**0.0069**	**0.7239**					
PAH (mg/Kg)												
2-Methylnaphthalene	NS	NS	**0.013 J**	0.017 U	**0.12 J**	**0.11 J**	**0.046 J**	**0.013 J**	**0.26 J**	NS	NS	NS
Acenaphthene	100	NS	**0.017 J**	**0.019 J**	**0.14 J**	**0.4**	**0.016 J**	**0.048 J**	**0.35 J**	NS	NS	NS
Acenaphthylene	100	NS	**0.034 J**	**0.061 J**	**0.62**	**0.25 J**	0.0032 U	**0.017 J**	**0.76 J**	NS	NS	NS
Anthracene	100	NS	**0.048 J**	**0.08 J**	**0.88**	**0.98**	**0.021 J**	**0.14 J**	**1.1**	NS	NS	NS
Benzo(a)anthracene	1	NS	**0.14**	**0.37**	**2.8**	**1.5**	**0.064**	**0.42**	**3.3**	NS	NS	NS
Benzo(a)pyrene	1	NS	**0.18**	**0.4**	**2.6**	**1.5**	**0.07**	**0.43**	**4.3 J**	NS	NS	NS
Benzo(b)fluoranthene	1	NS	**0.15**	**0.34**	**2**	**0.93**	**0.05**	**0.37**	**3.5 J**	NS	NS	NS
Benzo(ghi)perylene	100	NS	0.0044 U	**0.32 J**	**2.6**	**0.72**	**0.047 J**	**0.4**	**4.2 J**	NS	NS	NS
Benzo(k)fluoranthene	3.9	NS	**0.17**	**0.36**	**2**	**1.3**	**0.063**	**0.4**	**4 J**	NS	NS	NS
Chrysene	3.9	NS	**0.18 J**	**0.42**	**3.1**	**2**	**0.077 J**	**0.5**	**4.7**	NS	NS	NS
Dibenz(a,h)anthracene	0.33	NS	0.0027 U	**0.092**	**0.81**	**0.32**	0.0025 U	**0.13**	**1.1 J**	NS	NS	NS
Fluoranthene	100	NS	**0.3 J**	**0.62**	**3.7**	**1.8**	**0.13 J**	**0.79**	**9.1**	NS	NS	NS
Fluorene	100	NS	**0.021 J**	0.0025 U	**0.21 J**	**0.37 J**	**0.0086 J**	**0.046 J**	**0.46 J**	NS	NS	NS
Indeno(1,2,3-cd)pyrene	0.5	NS	**0.14**	**0.29**	**2.1**	**0.78**	**0.042**	**0.34**	**3.5 J**	NS	NS	NS
Naphthalene	100	NS	**0.032 J**	0.0032 U	**0.18 J**	**2.5**	**0.88**	0.0034 U	**0.65 J**	NS	NS	NS
Phenanthrene	100	NS	**0.22 J**	**0.3 J**	**3.2**	**0.86**	**0.091 J**	**0.59**	**7.2**	NS	NS	NS
Pyrene	100	NS	**0.32 J**	**0.72**	**7**	**3.3 J**	**0.13 J**	**1.1**	**12**	NS	NS	NS
Total PAH	NS	NS	**1.965**	**4.392**	**34.06**	**19.62**	**1.7356**	**5.734**	**60.48**	NS	NS	NS

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Shallow Soils
(0.1 - 17 ft bgs)

Location ID Sample Date Sample ID depth Interval	ST-NYSDEC Part 375-6 Restricted-Res	17CY005 3/3/2004 17CY005 DUP(9-11)030304 9-11	17CY006 3/2/2004 17CY006(9-11)030204 9-11	17CY007 1/29/2004 17CY007(0-2)012904 0-2	17CY007 1/30/2004 17CY007(2-4)013004 2-4	17CY007 2/16/2004 17CY007(8-10)021604 8-10	17CY007 2/16/2004 17CY007(14-16)021604 14-16	17CY008 1/29/2004 17CY008(0-2)012904 0-2	17CY008 1/29/2004 17CY008(2-4)012904 2-4	17CY008 2/9/2004 17CY008(9-11)020904 9-11	17CY009 2/9/2004 17CY009(8-10)020904 8-10	17CY010 2/9/2004 17CY010(7-9)020904 7-9
SVOC (mg/Kg)												
1,1-Biphenyl	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
2,4-Dimethylphenol	NS	NS	0.038 U	0.033 U	0.036 U	**0.013 J**	0.035 U	0.036 U	0.071 U	NS	NS	NS
2-Methylphenol	100	NS	0.037 U	0.033 U	0.035 U	0.035 U	0.034 U	0.035 U	0.07 U	NS	NS	NS
3+4-Methylphenols	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
4-Methylphenol	100	NS	0.041 U	0.036 U	0.039 U	**0.032 J**	0.038 U	0.039 U	0.076 U	NS	NS	NS
4-Nitroaniline	NS	NS	0.019 U	0.018 U	**0.21 J**	0.019 U	0.018 U	0.019 U	0.036 U	NS	NS	NS
Benzaldehyde	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
bis(2-Ethylhexyl) phthalate	NS	NS	**0.096 J**	0.022 U	**0.52**	**0.12 J**	**0.17 J**	**0.26 J**	0.047 U	NS	NS	NS
Carbazole	NS	NS	**0.019 J**	**0.028 J**	**0.21 J**	**0.068 J**	0.0028 U	**0.065 J**	**0.54 J**	NS	NS	NS
Dibenzofuran	59	NS	**0.017 J**	**0.01 J**	**0.11 J**	**0.06 J**	0.02 U	**0.026 J**	**0.38 J**	NS	NS	NS
Di-n-butyl phthalate	NS	NS	0.012 U	0.010 U	**0.098 J**	0.011 U	0.011 U	0.011 U	0.022 U	NS	NS	NS
Total SVOC			**2.097**	**4.43**	**35.208**	**19.913**	**1.9056**	**6.085**	**61.4**			
SVOC TICs (mg/kg)												
Total SVOC TICs		NS	NS	**3.43**	**17.52**	**29.43**	**6.16**	**25.07**	**23.52**	NS	NS	NS
Metals (mg/Kg)												
Aluminum		**8470**	**7080**	**8430**	**5000**	**5890 J**	NS	**9840**	**6080**	**6240 J**	**5340 J**	**6150 J**
Antimony		1.2 U	1.4 U	0.86 U	0.92 U	1.4 UJ	NS	0.91 U	0.90 U	1.4 UJ	1.4 UJ	1.4 UJ
Arsenic	16	**0.84 J**	**1.2 J**	**8.9**	**14.2**	**10.3**	NS	**13.7**	**21.5**	**4.3**	**3.4**	**5.8**
Barium	400	**124**	**64.5**	**106**	**552**	**87.4**	NS	**84.5**	**266**	**68.3**	**55.7**	**200**
Beryllium	72	**0.39 J**	**0.28 J**	**0.48 J**	**0.39 J**	**0.35 J**	NS	**0.58 J**	**0.43 J**	**0.36 J**	**0.36 J**	**0.42 J**
Cadmium	4.3	**0.27 J**	0.098 U	0.088 UJ	**1.3 J**	0.093 U	NS	**0.58 J**	**0.17 J**	0.095 U	0.093 U	**0.24 J**
Calcium		**3010**	**4280**	**1380**	**7780**	**12300**	NS	**1910**	**4040**	**35600 J**	**8900 J**	**10900 J**
Chromium	180	**17.4**	**13.9**	**16.6**	**30.5**	**13**	NS	**28.7**	**16.8**	**14.7**	**17.7**	**24.7**
Cobalt		**10.5**	**9.4 J**	**5.0 J**	**6.1 J**	**5.1 J**	NS	**5.4 J**	**8.7 J**	**5.4 J**	**5.5 J**	**5.8 J**
Copper	270	**28.4**	**29.8**	**35.5**	**120**	**27.2**	NS	**37**	**86.9**	**62.4 J**	**28.1 J**	**92.8 J**
Iron		**18700**	**15400**	**17000**	**25500**	**17500**	NS	**15800**	**30300**	**13000**	**13500**	**15600**
Lead	400	**42**	**61.3 J**	**114**	**1270**	**189**	NS	**122**	**1200**	**1590 J**	**109 J**	**617 J**
Magnesium		**4060**	**5130**	**1790**	**1840**	**2520**	NS	**1620**	**2580**	**3290**	**3770**	**2490**
Manganese	2000	**128**	**101**	**389**	**218**	**290**	NS	**501**	**425**	**378**	**389**	**251**
Mercury	0.81	**0.3**	**0.37 J**	**0.38**	**0.79**	**0.75**	NS	**3.9**	**2.9**	**0.56 J**	**0.48 J**	**0.67 J**
Nickel	310	**22.3**	**22.9**	**12.7**	**19.1**	**17.9**	NS	**16**	**33.5**	**18.5**	**25.3**	**16.7**
Potassium		**4250**	**3400**	**524 J**	**792 J**	**920 J**	NS	**415 J**	**905 J**	**736 J**	**593 J**	**868 J**
Selenium	180	0.90 U	1.0 U	0.86 U	4.6 U	0.98 U	NS	0.91 U	0.90 U	1.0 U	0.98 U	1.0 U
Silver	180	0.30 U	0.34 U	0.15 U	**0.18 J**	0.33 U	NS	0.16 U	**0.20 J**	0.33 U	0.33 U	**0.83 J**
Sodium		**213 J**	**208 J**	**91.9 J**	**134 J**	**176 J**	NS	84.2 UJ	**162 J**	**188 J**	**199 J**	**247 J**
Vanadium		**17.2**	**16.3**	**22.3**	**22.8**	**15.8**	NS	**35.6**	**22.2**	**16.1**	**14.4**	**21.1**
Zinc	10000	**81.8**	**76.7**	**114**	**478**	**109**	NS	**84**	**224**	**57.6**	**47.1**	**236**
Cyanide (mg/Kg)												
Cyanide, Total	27	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

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Shallow Soils
(0.1 - 17 ft bgs)

Location ID Sample Date Sample ID depth Interval	ST-NYSDEC Part 375-6 Restricted-Res	17GH001 2/10/2004 17GH001(5-7)021004 5-7	17GH001 2/10/2004 17GH001(13-15)021004 13-15	17GH002 2/24/2004 17GH002(9-11)022404 9-11	17GH002 2/24/2004 17GH002(15-17)022404 15-17	17GH003 2/27/2004 17GH003(7-9)020704 7-9	17GH003 2/27/2004 17GH003(15-15.5)020704 15-15.5	17GH004 2/27/2004 17GH004(9-11)020704 9-11	17GH005 2/12/2004 17GH005(9-11)021204 9-11	17GH006 2/19/2004 17GH006(5-7)021904 5-7	17GH006 2/20/2004 17GH006(13-15)022004 13-15	17SB02 3/13/2006 17SB02(2-4)031306 2-4
BTEX (mg/Kg)												
Benzene	4.8	**0.0044**	**0.0024**	**0.0044**	0.00025 U	**0.0012**	**0.0012**	**0.0009 J**	**0.0069**	**0.0006 J**	0.00028 U	0.027 U
Ethylbenzene	41	**0.0025 J**	**0.0017 J**	0.00023 U	0.00023 U	0.00022 U	0.00023 U	0.00023 U	**0.0006 J**	0.00022 U	0.00024 U	0.027 U
Toluene	100	0.0032 U	0.0025 U	**0.0053 J**	0.00023 U	**0.002 J**	**0.0024 J**	**0.0016 J**	**0.0038 J**	**0.0017 J**	0.00024 U	0.027 U
Xylene (Total)	100	**0.004 J**	**0.0028 J**	0.00055 U	0.00055 U	0.00052 U	0.00056 U	0.00056 U	**0.0028 J**	0.00052 U	**0.0016 J**	0.054 U
Total BTEX		**0.0109**	**0.0069**	**0.0097**	0	**0.0032**	**0.0036**	**0.0025**	**0.0141**	**0.0023**	**0.0016**	0
VOC (mg/Kg)												
1,2-Dichloroethane	3.1	0.00017 U	0.00018 U	0.00018 U	0.00018 U	0.00018 U	0.00018 U	0.00018 U	0.00018 U	0.00018 U	0.00019 U	0.027 U
2-Butanone (Methyl Ethyl Ketone)	100	**0.0069**	**0.0052 J**	0 R	**0.014 J**	0.0011 U	0.0011 U	**0.0092**	0 R	0.0011 U	**0.012 J**	0.14 U
Acetone	100	**0.056 J**	**0.051 J**	**0.058 J**	**0.086 J**	**0.042 J**	**0.056 J**	**0.041 J**	0.0028 UJ	**0.039 J**	**0.058 J**	0.14 U
Carbon Disulfide		**0.0011 J**	**0.0019 J**	0.00034 U	**0.0012 J**	**0.0018 J**	**0.0016 J**	**0.001 J**	**0.004 J**	0.00032 U	0.00036 U	0.027 U
Chloroform	49	0.00024 U	0.00027 U	0.00026 U	0.00026 U	0.00025 U	0.00027 U	0.00027 U	**0.001 J**	0.00025 U	0.00028 U	0.027 U
Methylene Chloride	100	0.0041 U	0.0021 U	0.00026 U	0.0008 U	0.0026 U	0.003 U	0.0032 U	0.00026 U	0.0009 U	0.00028 U	0.027 U
Trichloroethene	21	0.00027 U	0.00032 U	0.0003 U	0.0003 U	0.0003 U	0.00032 U	0.00032 U	0.0003 U	0.0003 U	0.00032 U	0.027 U
Total VOC		**0.0749**	**0.065**	**0.0677**	**0.1012**	**0.047**	**0.0612**	**0.0537**	**0.0191**	**0.0413**	**0.0716**	ND
VOC TICs (mg/kg)												
Total VOC TICs			**0.012**	**0.01**	**0.051**	**0.0097**		**0.0075**	**0.013**		**0.071**	
PAH (mg/Kg)												
2-Methylnaphthalene	NS	**0.27 J**	**0.014 J**	**0.099 J**	0.018 U	**0.023 J**	**0.023 J**	0.018 U	**0.23 J**	**0.0092 J**	**0.01 J**	0.37 U
Acenaphthene	100	**0.68 J**	**0.032 J**	**0.031 J**	**0.014 J**	**0.023 J**	**0.063 J**	0.0033 U	**0.17 J**	**0.035 J**	**0.0097 J**	0.37 U
Acenaphthylene	100	**0.55 J**	**0.033 J**	**0.052 J**	0.0033 U	**0.042 J**	**0.033 J**	0.0033 U	**0.23 J**	**0.033 J**	**0.015 J**	0.37 U
Anthracene	100	**2.2**	**0.089 J**	**0.15 J**	**0.013 J**	**0.056 J**	**0.055 J**	0.003 U	**0.61**	**0.11 J**	**0.03 J**	**0.079 J**
Benzo(a)anthracene	1	**4.3**	**0.21**	**0.28**	**0.035 J**	**0.17**	**0.15**	**0.016 J**	**2**	**0.28**	**0.064**	**0.46**
Benzo(a)pyrene	1	**3.8**	**0.17**	**0.24**	**0.046**	**0.2**	**0.18**	**0.024 J**	**1.7**	**0.28**	**0.057**	**0.44**
Benzo(b)fluoranthene	1	**3.6**	**0.12**	**0.15**	**0.029 J**	**0.16**	**0.12**	**0.018 J**	**1.2**	**0.22**	**0.039 J**	**0.55**
Benzo(ghi)perylene	100	**1.2**	**0.1 J**	**0.11 J**	0.0042 U	**0.16 J**	**0.15 J**	**0.02 J**	**1.1**	**0.18 J**	**0.04 J**	**0.2 J**
Benzo(k)fluoranthene	3.9	**3.8**	**0.19**	**0.26**	**0.047**	**0.2**	**0.18**	**0.022 J**	**1.9**	**0.28**	**0.062**	**0.22 J**
Chrysene	3.9	**4.3**	**0.23 J**	**0.26 J**	**0.035 J**	**0.21 J**	**0.19 J**	**0.021 J**	**2**	**0.29 J**	**0.069 J**	**0.48**
Dibenz(a,h)anthracene	0.33	0.0051 UJ	0.0026 UJ	**0.041**	0.0026 U	**0.047**	0.0026 U	0.0026 U	0.0027 UJ	**0.045**	0.0028 UJ	***0.37 U***
Fluoranthene	100	**7.8**	**0.44**	**0.49**	**0.063 J**	**0.3 J**	**0.32 J**	**0.025 J**	**3.1**	**0.55**	**0.13 J**	**0.79**
Fluorene	100	**0.72 J**	**0.036 J**	**0.085 J**	0.0027 U	**0.021 J**	**0.024 J**	0.0027 U	**0.18 J**	**0.032 J**	0.0029 U	0.37 U
Indeno(1,2,3-cd)pyrene	0.5	**1.4**	**0.1**	**0.093**	0.0025 U	**0.13**	**0.13**	**0.015 J**	**1.2**	**0.16**	**0.032 J**	**0.16 J**
Naphthalene	100	**0.57 J**	**0.045 J**	**0.14 J**	**0.03 J**	**0.038 J**	**0.097 J**	0.0034 U	**0.59**	**0.019 J**	**0.028 J**	0.37 U
Phenanthrene	100	**6.7**	**0.34 J**	**0.42**	**0.075 J**	**0.24 J**	**0.21 J**	**0.019 J**	**2.4**	**0.46**	**0.13 J**	**0.3 J**
Pyrene	100	**8.4**	**0.47**	**0.51**	**0.065 J**	**0.37 J**	**0.38 J**	**0.033 J**	**3**	**0.59**	**0.13 J**	**0.74**
Total PAH	NS	**50.29**	**2.619**	**3.411**	**0.452**	**2.39**	**2.305**	**0.213**	**21.61**	**3.5732**	**0.8457**	**4.419**

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Shallow Soils
(0.1 - 17 ft bgs)

Location ID Sample Date Sample ID depth Interval	ST-NYSDEC Part 375-6 Restricted-Res	17GH001 2/10/2004 17GH001(5-7)021004 5-7	17GH001 2/10/2004 17GH001(13-15)021004 13-15	17GH002 2/24/2004 17GH002(9-11)022404 9-11	17GH002 2/24/2004 17GH002(15-17)022404 15-17	17GH003 2/27/2004 17GH003(7-9)020704 7-9	17GH003 2/27/2004 17GH003(15-15.5)020704 15-15.5	17GH004 2/27/2004 17GH004(9-11)020704 9-11	17GH005 2/12/2004 17GH005(9-11)021204 9-11	17GH006 2/19/2004 17GH006(5-7)021904 5-7	17GH006 2/20/2004 17GH006(13-15)022004 13-15	17SB02 3/13/2006 17SB02(2-4)031306 2-4
SVOC (mg/Kg)												
1,1-Biphenyl	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.37 U
2,4-Dimethylphenol	NS	0.071 U	0.036 U	0.037 U	0.036 U	0.034 U	0.036 U	0.036 U	**0.0083 J**	0.033 U	0.039 U	0.37 U
2-Methylphenol	100	0.07 U	0.035 U	0.036 U	0.035 U	0.034 U	0.035 U	0.035 U	**0.0096 J**	0.033 U	0.038 U	0.37 U
3+4-Methylphenols	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
4-Methylphenol	100	**0.018 J**	0.039 U	**0.01 J**	**0.011 J**	**0.0079 J**	**0.026 J**	0.039 U	**0.032 J**	0.036 U	0.042 U	0.37 U
4-Nitroaniline	NS	0.036 U	0.019 U	0.019 U	0.019 U	0.018 U	0.019 U	0.019 U	0.019 U	0.018 U	0.02 U	0.92 U
Benzaldehyde	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.37 UJ
bis(2-Ethylhexyl) phthalate	NS	**0.5 J**	**0.094 J**	0.024 U	**0.18 J**	**0.12 J**	**0.14 J**	0.024 U	**0.26 J**	**0.15 J**	**0.11 J**	**0.11 J**
Carbazole	NS	**0.43 J**	**0.025 J**	**0.031 J**	0.0029 U	**0.028 J**	**0.021 J**	0.0029 U	**0.19 J**	**0.033 J**	0.0031 U	0.37 U
Dibenzofuran	59	**0.52 J**	**0.029 J**	**0.061 J**	0.02 U	**0.019 J**	**0.02 J**	0.02 U	**0.23 J**	**0.023 J**	**0.014 J**	0.37 U
Di-n-butyl phthalate	NS	0.022 U	0.011 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U	0.010 U	0.012 U	0.37 U
Total SVOC		**51.758**	**2.767**	**3.513**	**0.643**	**2.5649**	**2.512**	**0.213**	**22.3399**	**3.7792**	**0.9697**	**4.529**
SVOC TICs (mg/kg)												
Total SVOC TICs		**18.62**	**0.34**	**1.16**	**1.85**	**3.58**	**2.65**	**5.24**	**15.05**	NS	NS	**2.105**
Metals (mg/Kg)												
Aluminum		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**6630 J**
Antimony		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	6.6 UJ
Arsenic	16	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**5.6 J**
Barium	400	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**55 J**
Beryllium	72	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**0.37 J**
Cadmium	4.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.55 UJ
Calcium		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**3680 J**
Chromium	180	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**16.5 J**
Cobalt		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**5 J**
Copper	270	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**30.7 J**
Iron		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**19600 J**
Lead	400	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**66.7 J**
Magnesium		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**2190 J**
Manganese	2000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**363 J**
Mercury	0.81	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**0.134**
Nickel	310	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**13.5 J**
Potassium		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**1310 J**
Selenium	180	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	1.1 U
Silver	180	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**0.11 J**
Sodium		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	558 UJ
Vanadium		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**30.5 J**
Zinc	10000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**50.4 J**
Cyanide (mg/Kg)												
Cyanide, Total	27	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.558 U

Notes:
Bolded values = detected in sample
Yellow highlighted values = exceed ST-NYSDEC Part 375-6 Restricted-Residential
U = Nondetected result. The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit
J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
J+ = (Inorganics) The result is an estimated quantity, but the result may be biased high.
J- = (Inorganics) The result is an estimated quantity, but the result may be biased low.
R = The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet the quality control criteria.
The presence of absence of the analyte cannot be verified.

Table A-1
Summary of Soil Analytical Data
East 17th Street Station Site
Shallow Soils
(0.1 - 17 ft bgs)

Location ID Sample Date Sample ID depth Interval	ST-NYSDEC Part 375-6 Restricted-Res	17SB03 3/15/2006 17SB03(2-4)031506 2-4	17SB03 3/23/2006 17SB03(8-9)032306 8-9	17SB04 3/14/2006 17SB04(2-4)031406 2-4	17SB05 4/4/2006 17SB05(2-4)040406 2-4	17SB05 4/26/2006 17SB05(5-7)042606 5-7	17SB06 5/8/2006 17SB06 DUP(2-4)050806 2-4	17SB06 5/8/2006 17SB06(2-4)050806 2-4	17WVSB02 5/12/2008 17WVSB02(10-13)051208 10-13	ST17SB08 5/28/2008 ST17SB08(14-18)052808 14-18
BTEX (mg/Kg)										
Benzene	4.8	0.027 U	**0.011 J**	0.03 U	0.028 U	0.028 U	0.028 U	0.029 U	0.0045 U	0.0056 U
Ethylbenzene	41	0.027 U	0.027 U	0.03 U	0.028 U	0.028 U	0.028 U	0.029 U	0.0050 U	0.0062 U
Toluene	100	0.027 U	0.027 U	0.03 U	**0.003 J**	0.028 U	0.028 U	0.029 U	0.0055 U	0.0068 U
Xylene (Total)	100	0.053 U	0.054 U	0.061 U	**0.005 J**	0.055 U	**0.0087 J**	0.057 U	ND	ND
Total BTEX		0	**0.011**	0	**0.008**	0	**0.0087**	0	ND	ND
VOC (mg/Kg)										
1,2-Dichloroethane	3.1	0.027 U	0.027 U	0.03 U	0.028 U	0.028 U	0.028 U	0.029 U	0.0052 U	0.0063 U
2-Butanone (Methyl Ethyl Ketone)	100	0.13 U	0.14 U	0.15 U	0.14 U	0.14 U	0.14 U	0.14 U	0.032 U	0.039 U
Acetone	100	0.13 U	0.14 U	**0.04 J**	0.14 UJ	0.14 U	0.14 U	0.14 U	0.110 U	0.130 U
Carbon Disulfide		0.027 U	0.027 U	**0.0073 J**	0.028 U	0.028 UJ	0.028 U	0.029 U	0.0068 U	0.0084 U
Chloroform	49	0.027 U	0.027 U	0.03 U	0.028 U	0.028 U	0.028 U	0.029 U	0.0056 U	0.0069 U
Methylene Chloride	100	0.057 UJ	0.044 UJ	0.03 U	0.028 U	0.028 U	0.049 UJ	0.2 UJ	0.015 U	0.019 U
Trichloroethene	21	0.027 U	0.027 U	0.03 U	0.028 U	0.028 U	0.028 U	0.029 U	0.0046 U	0.0056 U
Total VOC		ND	**0.011**	**0.0473**	**0.008**	ND	**0.0087**	ND	ND	ND
VOC TICs (mg/kg)										
Total VOC TICs										
PAH (mg/Kg)										
2-Methylnaphthalene	NS	0.37 U	0.36 U	0.39 U	0.37 U	0.37 U	1.9 U	1.9 U	**9300.000**	0.015 U
Acenaphthene	100	**0.12 J**	0.36 U	**0.079 J**	0.37 U	0.37 U	1.9 U	1.9 U	**4000**	0.011 U
Acenaphthylene	100	**0.084 J**	0.36 U	**0.21 J**	0.37 U	0.37 U	1.9 U	1.9 U	**3200**	0.0075 U
Anthracene	100	**0.33 J**	0.36 U	**0.7**	**0.12 J**	**0.2 J**	**0.33 J**	**0.61 J**	**4300**	0.017 U
Benzo(a)anthracene	1	**1.5**	0.36 U	**1.5**	**0.65**	**1.4 J**	**1.3 J**	**1.8 J**	**4300**	**0.093 J**
Benzo(a)pyrene	1	**1.4**	0.36 U	**1.5**	**0.67**	**0.88 J**	**1.1 J**	**2.2 J**	**2800**	**0.079 J**
Benzo(b)fluoranthene	1	**1.8**	0.36 U	**2**	**0.84**	**2.2**	**1.9 J**	**2.7 J**	**3300**	**0.096 J**
Benzo(ghi)perylene	100	**0.56**	0.36 U	**0.4**	**0.8**	**0.64 J**	**0.96 J**	**1.3 J**	**1100.000 J**	0.037 U
Benzo(k)fluoranthene	3.9	**0.75**	0 R	**0.69**	**0.28 J**	**0.77 J**	**0.6 J**	**0.93 J**	**1100.000 J**	0.024 U
Chrysene	3.9	**1.6**	0.36 U	**1.5**	**0.64**	**1.3 J**	**1.4 J**	**1.8 J**	**3500**	**0.083 J**
Dibenz(a,h)anthracene	0.33	**0.055 J**	***0.36 U***	***0.39 U***	**0.2 J**	***1.8 U***	***1.9 UJ***	***1.9 UJ***	**300.000 J**	0.038 U
Fluoranthene	100	**2.4**	0.36 U	**2.7**	**1**	**2.7**	**2.1**	**2.9**	**9700**	**0.180 J**
Fluorene	100	**0.11 J**	0.36 U	**0.18 J**	0.37 U	0.37 U	1.9 U	1.9 U	**6000**	0.014 U
Indeno(1,2,3-cd)pyrene	0.5	**0.53**	0.36 U	**0.27 J**	**0.71**	**0.53 J**	**0.37 J**	**0.49 J**	**1100.000 J**	0.013 U
Naphthalene	100	**0.14 J**	0.36 U	**0.16 J**	0.37 U	0.37 U	1.9 U	1.9 U	**36000.002 D**	**0.071 J**
Phenanthrene	100	**1.3**	0.36 U	**1.9**	**0.45**	**0.91**	**1.3 J**	**2.3**	**19000.001 D**	**0.230 J**
Pyrene	100	**2.2**	0.36 U	**2.6**	**1.4**	**2.7**	**3.4**	**4.7**	**8300**	**0.180 J**
Total PAH	NS	**13.079**	ND	**16.389**	**7.76**	**14.23**	**14.76**	**21.73**	**1.532**	**1.012**

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Table A-1
Summary of Soil Analytical Data
East 17th Street Station Site
Shallow Soils
(0.1 - 17 ft bgs)

Location ID Sample Date Sample ID depth Interval	ST-NYSDEC Part 375-6 Restricted-Res	17SB03 3/15/2006 17SB03(2-4)031506 2-4	17SB03 3/23/2006 17SB03(8-9)032306 8-9	17SB04 3/14/2006 17SB04(2-4)031406 2-4	17SB05 4/4/2006 17SB05(2-4)040406 2-4	17SB05 4/26/2006 17SB05(5-7)042606 5-7	17SB06 5/8/2006 17SB06 DUP(2-4)050806 2-4	17SB06 5/8/2006 17SB06(2-4)050806 2-4	17WVSB02 5/12/2008 17WVSB02(10-13)051208 10-13	ST17SB08 5/28/2008 ST17SB08(14-18)052808 14-18
SVOC (mg/Kg)										
1,1-Biphenyl	NS	0.37 U	0.36 U	0.39 U	0.37 U	0.37 U	1.9 U	1.9 U	**1800.000 J**	0.015 U
2,4-Dimethylphenol	NS	0.37 U	0.36 U	0.39 U	0.37 U	0.37 U	1.9 U	1.9 U	110.000 U	0.015 U
2-Methylphenol	100	0.37 U	0.36 U	0.39 U	0.37 U	0.37 U	1.9 U	1.9 U	***110.000 U***	0.014 U
3+4-Methylphenols	NS	NS	NS	NS	NS	NS	NS	NS	0.012 U	**0.410 J**
4-Methylphenol	100	0.37 U	0.36 U	0.39 U	0.37 U	0.37 U	1.9 U	1.9 U	NS	NS
4-Nitroaniline	NS	0.92 U	0.92 U	0.97 U	0.94 U	0.93 U	4.7 U	4.8 U	260.000 U	0.041 U
Benzaldehyde	NS	0.37 U	0.36 UJ	0.39 UJ	0.37 UJ	0 R	0 R	0 R	100.000 U	0.017 U
bis(2-Ethylhexyl) phthalate	NS	0.37 U	0.36 U	**0.085 J**	0.37 U	1.8 U	1.9 U	1.9 U	69.000 U	0.020 U
Carbazole	NS	**0.11 J**	0.36 U	**0.13 J**	0.37 U	**0.069 J**	1.9 U	1.9 U	**2000.000**	0.039 U
Dibenzofuran	59	0.37 U	0.36 U	**0.1 J**	0.37 U	0.37 U	1.9 U	1.9 U	**4600**	0.016 U
Di-n-butyl phthalate	NS	0.37 U	0.36 U	0.39 U	0.37 U	0.37 U	1.9 U	1.9 U	150.000 U	0.024 U
Total SVOC		**14.989**	ND	**16.704**	**7.76**	**14.299**	**14.76**	**21.73**	**1.766**	**1.422**
SVOC TICs (mg/kg)										
Total SVOC TICs		**6.676**	**2.18**	**12.06**	**0.75**	**3.04**	**3.2**	**6.16**	NS	NS
Metals (mg/Kg)										
Aluminum		**6370 J**	**4990**	**3830 J**	**4750 J**	**3460 J**	**4140 J**	**4350 J**	**9090**	**5220**
Antimony		**1.4 J**	6.68 UJ	**18.5 J**	**16.3 J**	6.59 UJ	6.82 UJ	**17 J**	**1.030 J**	**3.770**
Arsenic	16	**4.8 J**	**1.77**	**15.4**	**4.79**	**3.64**	**5.78 J**	**6.21 J**	**7.360**	**18.2**
Barium	400	**134 J**	**66.5**	**103 J**	**889 J**	**411 J**	**192 J**	**314 J**	**255**	**406**
Beryllium	72	**0.38 J**	0.565 U	**0.43 J**	**0.268 J**	0.55 U	**0.252 J**	**0.233 J**	**0.162 J**	0.031 U
Cadmium	4.3	0.55 UJ	**0.099 J**	0.59 UJ	**0.376 J**	**0.655 J**	0.568 UJ	0.565 UJ	**1.310**	**1.540**
Calcium		**2160 J**	**8260 J**	**11700 J**	**26600 J**	**14100 J**	**17700 J**	**17000 J**	**18000**	**12000**
Chromium	180	**26.7 J**	**11.5**	**9.8 J**	**13.3**	**12**	**10.8 J**	**13.3 J**	**17.9**	**14.7**
Cobalt		**6.4 J**	**5.03 J**	**7.1 J**	**5.5 J**	**4.1 J**	**5.11 J**	**9.92**	**7.110**	**7.170**
Copper	270	**81 J**	**25.7 J**	**45.7 J**	**38.2**	**35.8 J**	**43.9**	**49**	**305**	**99.2**
Iron		**18200 J**	**8550**	**14600 J**	**13300 J**	**8960 J**	**11500 J**	**13900 J**	**15700**	**23100**
Lead	400	**259 J**	**82.4**	**183 J**	**1200 J**	**318**	**245**	**287**	**224**	**1000 J**
Magnesium		**2220 J**	**3110**	**3720 J**	**2920 J**	**1980 J**	**1830 J**	**1930 J**	**5080**	**1290**
Manganese	2000	**281 J**	**214**	**120 J**	**284 J**	**197**	**230 J**	**251 J**	**336**	**138**
Mercury	0.81	**0.401**	**0.374**	**0.619**	**0.477 J**	**0.388 J**	**1.3**	**1.7**	0.009 U	**0.873**
Nickel	310	**13.6 J**	**22.4**	**14.3 J**	**16.9 J**	**15.1 J**	**14.1 J**	**20.7 J**	**18.8**	**22.2**
Potassium		**1020 J**	**1310 J**	**726 J**	**1400 J**	**1120 J**	**1050 J**	**1160 J**	**1130**	**810 J**
Selenium	180	**1.6 J**	1.11 U	**1.8 J**	1.14 UJ	1.1 UJ	1.14 U	1.13 U	0.674 U	0.850 U
Silver	180	1.1 UJ	0 R	**0.22 J**	1.14 UJ	**2.65 J**	**2.4 J**	**3.02 J**	**0.470**	0.218 U
Sodium		**87.6 J**	**200 J**	**945 J**	**527 J**	**397 J**	**485 J**	**383 J**	**556**	**865**
Vanadium		**25.7 J**	**15.1**	**18.8 J**	**24.7**	**21.5**	**20**	**17.8**	**27.8**	**20.1**
Zinc	10000	**171 J**	**42.2**	**55 J**	**376 J**	**256 J**	**159 J**	**237 J**	**164**	**147**
Cyanide (mg/Kg)										
Cyanide, Total	27	0.556 U	0.557 U	**0.891**	0.568 U	0.56 U	**0.93**	**1.33**	0.617 U	**8.89**

Notes:
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is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
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The presence of absence of the analyte cannot be verified.

Table A-2
Summary of Soil Analytical Data
East 17th Street Station Site
Intermediately Deep Soils
(below 17 ft bgs.)

Location ID Sample Date Sample ID depth Interval	ST-NYSDEC Part 375-6 Restricted-Res	17CY003 2/26/2004 17CY003(21-23)022604 21-23	17CY003 2/26/2004 17CY003(29-31)022604 29-31	17CY004 2/13/2004 17CY004(29-30)021304 29-30	17CY006 3/2/2004 17CY006(19-21)030204 19-21	17CY006 3/2/2004 17CY006(25-25.5)030204 25-25.5	17CY007 2/16/2004 17CY007(28-30)021604 28-30	17GH001 3/9/2004 17GH001(28-30)030904 28-30	17GH002 2/24/2004 17GH002(29-31)022404 29-31	17GH004 3/1/2004 17GH004(19-20)030104 19-20	17GH004 3/1/2004 17GH004(27-27.5)030104 27-27.5
BTEX (mg/Kg)											
Benzene	4.8	**0.0021**	0.00028 U	**0.021**	**0.0006 J**	**9.2**	**0.0029**	**0.49**	0.00025 U	0.0003 U	**0.038**
Ethylbenzene	41	0.00024 U	0.00023 U	**0.0029 J**	0.00023 U	**13**	**0.003 J**	**0.48**	0.00022 U	0.00025 U	**0.034**
m,p-Xylene		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
o-Xylene		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Toluene	100	**0.0017 J**	0.00023 U	0.0049 U	0.00024 U	**2**	**0.0018 J**	**0.23 J**	0.00022 U	0.00026 U	**0.0068**
Total Xylene (calculated)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Xylene (Total)	100	0.00057 U	0.00056 U	**0.006**	0.00057 U	**15**	**0.0058 J**	**0.88**	0.00054 U	0.00061 U	**0.057**
Total BTEX		**0.0038**	0	**0.0299**	**0.0006**	**39.2**	**0.0135**	**2.08**	0	0	**0.1358**
VOC (mg/Kg)											
1,1,1-Trichloroethane	100	0.00033 U	0.00032 U	0.00032 U	0.00033 U	0.049 U	0.00033 U	0.041 U	0.00031 U	0.00036 U	0.00032 U
2-Butanone (Methyl Ethyl Ketone)	100	**0.008 J**	**0.019 J**	0.0011 U	0.0012 U	0.26 U	0.0012 U	0 R	0 R	0.0013 U	**0.0081**
Acetone	100	**0.025 J**	**0.048 J**	**0.063**	**0.01 J**	0.25 U	**0.041 J**	0.21 U	**0.055 J**	0.0031 UJ	**0.029 J**
Carbon Disulfide		**0.0036 J**	**0.0024 J**	**0.0039 J**	**0.0016 J**	0.034 U	**0.001 J**	0.029 UJ	**0.0039 J**	**0.0015 J**	**0.0019 J**
cis-1,2-Dichloroethene	100	0.00035 U	0.00035 U	0.00034 U	0.00035 U	0.029 U	0.00035 U	0.025 U	**0.0012 J**	0.00038 U	0.00035 U
Cyclohexane		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Isopropylbenzene		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Methylcyclohexane		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Methylene Chloride	100	0.0009 U	0.0008 U	0.0007 U	0.0008 U	0.017 U	**0.006 J**	0.014 U	0.00026 U	0.0005 U	0.0011 U
Styrene		0.00014 U	0.00014 U	0.00014 U	0.00014 U	**0.28 J**	0.00014 U	0.018 U	0.00013 U	0.00015 U	0.00014 U
Trichloroethene	21	0.00032 U	0.00032 U	0.0003 U	0.00032 U	0.032 U	0.00032 U	0.027 U	0.0003 U	0.00035 U	**0.0013**
Total VOC		**0.0404**	**0.0694**	**0.0968**	**0.0122**	**39.48**	**0.0615**	**2.08**	**0.0601**	**0.0015**	**0.1761**
VOC TICs (mg/kg)											
Total VOC TICs		**0.13**	**0.0098**	**0.14**	**0.0095**	**301.5**	**0.0842**	**12.56**	**0.055**	**0.0762**	**0.24**
PAH (mg/Kg)											
2-Methylnaphthalene	NS	**0.012 J**	**0.011 J**	0.018 U	**0.015 J**	**15**	**1.3**	**0.15 J**	0.019 U	**0.074 J**	**0.72**
Acenaphthene	100	**0.024 J**	0.0034 U	**0.047 J**	**0.03 J**	**12**	**0.89**	**0.21 J**	0.0034 U	**0.16 J**	**0.77**
Acenaphthylene	100	**0.022 J**	**0.017 J**	**0.016 J**	**0.04 J**	**5.6**	**0.33 J**	**0.077 J**	0.0034 U	**0.035 J**	**0.35 J**
Anthracene	100	**0.066 J**	**0.028 J**	**0.06 J**	**0.11 J**	**17**	**1.7**	**0.33 J**	0.0031 U	**0.29 J**	**0.99**
Benzo(a)anthracene	1	**0.17**	**0.071**	**0.1**	**0.28**	**16**	**1.2**	**0.38**	0.011 U	**0.47**	**1.8**
Benzo(a)pyrene	1	**0.15**	**0.066**	**0.11**	**0.27**	**14**	**0.87**	**0.29**	0.003 U	**0.45**	**2**
Benzo(b)fluoranthene	1	**0.094**	**0.041**	**0.081**	**0.22**	**11**	**0.48**	**0.23**	0.0031 U	**0.32**	**1.6**
Benzo(ghi)perylene	100	**0.082 J**	**0.037 J**	**0.056 J**	**0.2 J**	**6.5**	**0.3 J**	**0.16 J**	0.0043 U	**0.29 J**	**1.1**
Benzo(k)fluoranthene	3.9	**0.15**	**0.067**	**0.1**	**0.29**	**14**	**0.86**	**0.31 J**	0.0042 U	**0.44**	**1.8**
Chrysene	3.9	**0.17 J**	**0.08 J**	**0.12 J**	**0.31 J**	**16**	**1.1**	**0.38**	0.005 U	**0.46**	**2.1**
Dibenz(a,h)anthracene	0.33	0.0027 U	0.0026 U	0.0026 UJ	0.0026 U	**2.2**	**0.1**	**0.062**	0.0026 U	**0.082**	**0.31**
Fluoranthene	100	**0.3 J**	**0.12 J**	**0.15 J**	**0.6**	**47**	**2.3**	**1.1**	0.0013 U	**1**	**6**
Fluorene	100	**0.024 J**	0.0028 U	**0.019 J**	**0.043 J**	**15**	**1.3**	**0.36 J**	0.0028 U	**0.17 J**	**0.87**
Indeno(1,2,3-cd)pyrene	0.5	**0.073**	**0.031 J**	**0.054 J**	**0.18**	**6.7**	**0.32**	**0.16**	0.0026 U	**0.27**	**1.2**
Naphthalene	100	**0.014 J**	0.0035 U	**0.027 J**	**0.049 J**	**51**	**2.7**	**0.52**	0.0035 U	**0.14 J**	**3.1**
Phenanthrene	100	**0.24 J**	**0.11 J**	**0.11 J**	**0.42**	**79**	**5**	**1.5**	0.0037 U	**1.3**	**6.5**
Pyrene	100	**0.34 J**	**0.12 J**	**0.21 J**	**0.73**	**43**	**2.2 J**	**0.84**	0.0028 U	**1.1**	**6**
Total PAH	NS	**1.931**	**0.799**	**1.26**	**3.787**	**371**	**22.95**	**7.059**	0	**7.051**	**37.21**

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Location ID Sample Date Sample ID depth Interval	ST-NYSDEC Part 375-6 Restricted-Res	17CY003 2/26/2004 17CY003(21-23)022604 21-23	17CY003 2/26/2004 17CY003(29-31)022604 29-31	17CY004 2/13/2004 17CY004(29-30)021304 29-30	17CY006 3/2/2004 17CY006(19-21)030204 19-21	17CY006 3/2/2004 17CY006(25-25.5)030204 25-25.5	17CY007 2/16/2004 17CY007(28-30)021604 28-30	17GH001 3/9/2004 17GH001(28-30)030904 28-30	17GH002 2/24/2004 17GH002(29-31)022404 29-31	17GH004 3/1/2004 17GH004(19-20)030104 19-20	17GH004 3/1/2004 17GH004(27-27.5)030104 27-27.5
SVOC (mg/Kg)											
1,1-Biphenyl	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
2,4-Dimethylphenol	NS	0.038 U	0.037 U	0.036 U	0.037 U	**0.6 J**	0.038 U	0.035 U	0.037 U	0.04 U	**2.2**
2-Methylphenol	100	0.037 U	0.036 U	0.035 U	0.036 U	**0.68 J**	0.037 U	0.034 U	0.036 U	0.039 U	**3.8**
3+4-Methylphenols	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
4-Methylphenol	100	0.041 U	**0.031 J**	0.039 U	0.04 U	**1 J**	**0.1 J**	0.038 U	0.04 U	0.043 U	**8.4**
Acetophenone	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Benzaldehyde	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
bis(2-Ethylhexyl) phthalate	NS	0.025 U	0.024 U	**0.17 J**	0.024 U	0.23 U	**0.13 J**	0.023 U	0.024 U	0.026 U	0.024 U
Carbazole	NS	**0.014 J**	0.0029 U	**0.019 J**	**0.036 J**	**7.5**	**0.3 J**	**0.19 J**	0.0029 U	**0.13 J**	**0.52**
Dibenzofuran	59	**0.013 J**	0.021 U	**0.02 J**	**0.028 J**	**13**	**0.64**	**0.22 J**	0.021 U	**0.12 J**	**0.63**
Phenol	100	0.055 U	0.054 U	0.052 U	0.054 U	**0.88 J**	0.055 U	0.051 U	0.054 U	0.058 U	**9.1**
Total SVOC		**1.958**	**0.83**	**1.469**	**3.851**	**394.66**	**24.12**	**7.469**	ND	**7.301**	**61.86**
SVOC TICs (mg/kg)											
Total SVOC TICs		**1.1**	**4.65**	**0.7**	NS	**114.6**	**19.05**	**2.08**	NS	**0.35**	**13.81**
Metals (mg/Kg)											
Aluminum		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Antimony		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Arsenic	16	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Barium	400	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Beryllium	72	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Cadmium	4.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Calcium		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Chromium	180	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Cobalt		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Copper	270	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Iron		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Lead	400	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Magnesium		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Manganese	2000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Mercury	0.81	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Nickel	310	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Potassium		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Selenium	180	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Silver	180	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Sodium		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Thallium		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Vanadium		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Zinc	10000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Cyanide (mg/Kg)											
Cyanide, Total	27	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Cyanide-Amenable		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

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BTEX (mg/Kg)												
Benzene	4.8	**0.0036**	**1.2**	**0.23**	**0.074**	**0.0042 J**	**0.26**	0.031 U	0.031 U	**210 J**	**0.37 J**	**0.019 J**
Ethylbenzene	41	**0.0033 J**	**0.82**	**0.29 J**	0.045 U	0.031 U	**0.073**	0.031 U	0.031 U	**210 J**	**0.28 J**	**0.007 J**
m,p-Xylene		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
o-Xylene		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Toluene	100	**0.013**	**1.1**	**0.077 J**	**0.0048 J**	0.031 U	**0.014 J**	0.031 U	0.031 U	**320 J**	**0.5 J**	**0.015 J**
Total Xylene (calculated)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Xylene (Total)	100	**0.017**	**2.2**	**0.48 J**	**0.069 J**	0.062 U	**0.32**	0.062 U	0.063 U	**390 J**	**0.51 J**	**0.013 J**
Total BTEX		**0.0369**	**5.32**	**1.077**	**0.1478**	**0.0042**	**0.667**	0	0	**1130**	**1.66**	**0.054**
VOC (mg/Kg)												
1,1,1-Trichloroethane	100	0.00031 U	0.045 U	0.041 U	0.045 U	0.031 U	0.042 U	0.031 U	0.031 U	**0.26 J**	0.75 U	0.03 U
2-Butanone (Methyl Ethyl Ketone)	100	0 R	0 R	0 R	**0.2 J**	0.16 U	**0.037 J**	0.15 U	0.16 U	5 UJ	3.8 UJ	0.15 U
Acetone	100	**0.035 J**	**2.3**	0 R	**0.39 J**	0.16 U	0.21 U	0.15 U	0.16 U	5 U	3.8 UJ	0.15 U
Carbon Disulfide		**0.0031 J**	0.031 UJ	**0.058 J**	**0.073 J**	**0.028 J**	**0.016 J**	0.031 U	0.031 U	**0.083 J**	0.75 U	0.03 U
cis-1,2-Dichloroethene	100	0.00033 U	0.027 U	0.025 U	0.045 U	**0.0047 J**	0.042 U	0.031 U	0.031 U	0.99 U	0.75 U	0.03 U
Cyclohexane		NS	NS	NS	0.045 U	0.031 U	0.042 U	0.031 U	0.031 U	**0.74 J**	0.75 U	0.03 U
Isopropylbenzene		NS	NS	NS	**0.013 J**	0.031 U	**0.064**	0.031 U	0.031 U	**1.8**	0.75 U	0.03 U
Methylcyclohexane		NS	NS	NS	0.045 U	0.031 U	0.042 U	0.031 U	0.031 U	**1.7**	0.75 U	0.03 U
Methylene Chloride	100	0.0003 U	0.016 U	0.014 U	0.084 UJ	0.12 UJ	0.11 UJ	0.031 UJ	0.031 UJ	0.99 U	0.75 U	0.065 UJ
Styrene		**0.001 J**	**0.065 J**	0.018 U	0.045 U	0.031 U	0.042 U	0.031 U	0.031 U	**14 J**	0.75 U	0.03 U
Trichloroethene	21	0.0003 U	0.03 U	0.027 U	0.045 U	0.031 U	0.042 U	0.031 U	0.031 U	0.99 UJ	0.75 UJ	0.03 U
Total VOC		**0.076**	**7.685**	**1.135**	**0.8238**	**0.0369**	**0.784**	ND	ND	**1148.583**	**1.66**	**0.054**
VOC TICs (mg/kg)												
Total VOC TICs		**0.019**	**15.14**		**0.75**		**16.38**			**115.5**	**3**	**0.037**
PAH (mg/Kg)												
2-Methylnaphthalene	NS	**0.14 J**	**46**	**20**	**0.14 J**	0.41 U	**0.45 J**	0.4 U	0.42 U	**20**	0.39 U	0.39 U
Acenaphthene	100	**0.18 J**	**37 J**	**21**	**0.12 J**	0.41 U	**0.14 J**	0.4 U	0.42 U	**7.2**	0.39 U	0.39 U
Acenaphthylene	100	**0.37 J**	**20 J**	**3.4 J**	0.59 U	0.41 U	0.58 U	0.4 U	0.42 U	**9.8**	0.39 U	0.39 U
Anthracene	100	**0.39**	**61**	**19**	**0.34 J**	0.41 U	**0.43 J**	0.4 U	0.42 U	**20**	0.39 U	0.39 U
Benzo(a)anthracene	1	**1.2**	**81**	**13**	**0.53 J**	0.41 U	0.58 U	0.4 U	0.42 U	**28**	0.39 U	0.39 U
Benzo(a)pyrene	1	**1.3**	**84**	**11**	**0.46 J**	0.41 U	0.58 U	0.4 U	0.42 U	**32**	0.39 U	0.39 U
Benzo(b)fluoranthene	1	**1**	**64**	**8.6**	**0.45 J**	0.41 U	0.58 U	0.4 U	0.42 U	**34**	0.39 U	0.39 U
Benzo(ghi)perylene	100	**0.86**	**56**	**7.8**	**0.29 J**	0.41 U	0.58 U	0.4 U	0.42 U	**20**	0.39 U	0.39 U
Benzo(k)fluoranthene	3.9	**1.3**	**91**	**13**	**0.19 J**	0.41 U	0.58 UJ	0.4 U	0.42 U	**11**	0.39 U	0.39 U
Chrysene	3.9	**1.6**	**100**	**15**	**0.5 J**	0.41 U	0.58 U	0.4 U	0.42 U	**30**	0.39 U	0.39 U
Dibenz(a,h)anthracene	0.33	0.0025 UJ	0.28 UJ	0.025 UJ	***0.59 U***	***0.41 U***	***0.58 U***	***0.4 U***	***0.42 U***	**1.1**	***0.39 U***	***0.39 U***
Fluoranthene	100	**3.7**	**320**	**47**	**1**	0.41 U	**0.93 J**	0.4 U	0.42 U	**150**	0.39 U	0.39 U
Fluorene	100	**0.53**	**76**	**22**	**0.27 J**	0.41 U	**0.46 J**	0.4 U	0.42 U	**30**	0.39 U	0.39 U
Indeno(1,2,3-cd)pyrene	0.5	**0.82**	**52**	**7.3 J**	**0.42 J**	0.41 U	**0.2 J**	0.4 U	0.42 U	**23**	0.39 U	0.39 U
Naphthalene	100	**0.81**	**330**	**71**	**0.2 J**	0.41 U	**1.3**	0.4 U	0.42 U	**150**	0.39 U	0.39 U
Phenanthrene	100	**4.4**	**440**	**81**	**1.2**	0.41 U	**1.6 J**	0.4 U	0.42 U	**170**	0.39 U	0.39 U
Pyrene	100	**3.8**	**290**	**38**	**0.83**	0.41 U	**0.79 J**	0.4 U	0.42 U	**110**	0.39 U	0.39 U
Total PAH	NS	**22.4**	**2148**	**398.1**	**6.94**	ND	**6.3**	ND	ND	**846.1**	ND	ND

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SVOC (mg/Kg)												
1,1-Biphenyl	NS	NS	NS	NS	0.59 U	0.41 U	0.58 U	0.4 U	0.42 U	**4.7**	0.39 U	0.39 U
2,4-Dimethylphenol	NS	**0.013 J**	**1 J**	**0.98 J**	0.59 U	0.41 U	0.58 U	0.4 U	0.42 U	**0.67 J**	0.39 U	0.39 U
2-Methylphenol	100	**0.0092 J**	**1.8 J**	**1.2 J**	0.59 U	0.41 U	0.58 U	0.4 U	0.42 U	1 U	0.39 U	0.39 U
3+4-Methylphenols	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
4-Methylphenol	100	**0.035 J**	**4.3 J**	**3.3 J**	**0.11 J**	0.41 U	0.58 U	0.4 U	0.42 U	**1.7**	0.39 U	0.39 U
Acetophenone	NS	NS	NS	NS	0.59 U	0.41 U	0.58 U	0.4 U	0.42 U	**0.26 J**	0.39 U	0.39 U
Benzaldehyde	NS	NS	NS	NS	**0.15 J**	0 R	0.58 UJ	0.4 UJ	0.42 UJ	0 R	0 R	0 R
bis(2-Ethylhexyl) phthalate	NS	**0.16 J**	2.6 U	0.23 U	0.59 U	0.41 U	0.58 U	0.4 U	0.42 U	1 U	0.39 U	0.39 U
Carbazole	NS	**0.37 J**	**39 J**	**18**	**0.095 J**	0.41 U	**0.17 J**	0.4 UJ	0.42 UJ	**12 J**	0.39 U	0.39 U
Dibenzofuran	59	**0.33 J**	**53**	**19**	0.59 U	0.41 U	**0.19 J**	0.4 U	0.42 U	**21**	0.39 U	0.39 U
Phenol	100	0.051 U	**5.6 J**	**4.1**	0.59 U	0.41 U	0.58 U	0.4 U	0.42 U	**0.53 J**	0.39 U	0.39 U
Total SVOC		**23.3172**	**2252.7**	**444.68**	**7.295**	ND	**6.66**	ND	ND	**886.96**	ND	ND
SVOC TICs (mg/kg)												
Total SVOC TICs		**4.19**	**342**	**165.2**	**9.12**	**2.55**	**2.82**	**0.15**	**0.22**	**20.11**	**2.14**	**2.15**
Metals (mg/Kg)												
Aluminum		NS	NS	NS	**4000 J**	**968 J**	**16400**	**4100**	**5780**	**4270 J**	**686 J**	**613 J**
Antimony		NS	NS	NS	10.6 UJ	7.4 UJ	10.5 UJ	7.3 UJ	7.67 UJ	9.5 UJ	7.1 UJ	7.2 UJ
Arsenic	16	NS	NS	NS	**13.9 J**	1.2 U	**14.5**	1.2 U	**1.01 J**	**11.6 J**	1.2 U	1.2 U
Barium	400	NS	NS	NS	**60.3 J**	**15.4 J**	**85.9**	**20.2 J**	**153**	**160 J**	**18.9 J**	**13.2 J**
Beryllium	72	NS	NS	NS	0.9 U	0.6 U	**1.04 J**	0.61 U	0.64 U	0.8 U	0.6 U	0.60 U
Cadmium	4.3	NS	NS	NS	0.89 UJ	0.61 UJ	**0.497 J**	0.602 UJ	**0.05 J**	0.79 UJ	0.59 UJ	0.6 UJ
Calcium		NS	NS	NS	**6120 J**	**816 J**	**5620 J**	**713 J**	**10300 J**	**8380 J**	**7510 J**	**6650 J**
Chromium	180	NS	NS	NS	**11**	**4.2**	**31.4**	**11**	**16.2**	**11.2**	**2**	1.2 U
Cobalt		NS	NS	NS	**6.3 J**	**1.5 J**	**12.4**	**3.15 J**	**7.06**	**14.7 J**	**1.5 J**	6 U
Copper	270	NS	NS	NS	**65.8 J**	**6.9 J**	**46.1 J**	**8.2 J**	**10.4 J**	**110 J**	**6.3 J**	**6 J**
Iron		NS	NS	NS	**18000 J**	**2960 J**	**26200**	**5600**	**10700**	**95400 J**	**1940 J**	**1660 J**
Lead	400	NS	NS	NS	**548 J**	**4.3 J**	**174**	**2.95 J**	**7.36**	**1070 J**	**3.5 J**	**10 J**
Magnesium		NS	NS	NS	**2370**	**557 J**	**7360**	**1640**	**5440**	**1580**	**2390**	**2400**
Manganese	2000	NS	NS	NS	**416 J**	**24.2 J**	**947**	**50.7**	**305**	**1140 J**	**165 J**	**162 J**
Mercury	0.81	NS	NS	NS	**3.2 J**	**0.012 J**	**0.719**	0.012 U	0.013 U	**3.3 J**	0.012 UJ	0.012 UJ
Nickel	310	NS	NS	NS	**9.4 J**	**5.7**	**29.4 J**	**11.5**	**18.1 J**	**26.6 J**	4.8 U	4.8 U
Potassium		NS	NS	NS	**1630 J**	**285 J**	**3450 J**	**976 J**	**2810 J**	**929 J**	**499 J**	**414 J**
Selenium	180	NS	NS	NS	1.8 UJ	1.2 UJ	1.75 U	1.2 U	1.28 U	**5 J**	1.2 UJ	1.2 UJ
Silver	180	NS	NS	NS	**0.72 J**	0 R	0 R	0 R	0 R	**4.5 J**	0 R	0 R
Sodium		NS	NS	NS	**2790**	**75.2 J**	**2530**	**222 J**	**369 J**	**86.5 J**	**89.2 J**	5980 U
Thallium		NS	NS	NS	1.8 UJ	1.2 UJ	1.75 U	1.2 U	1.28 U	**2.4**	1.2 UJ	1.2 UJ
Vanadium		NS	NS	NS	**24.6 J**	**7.6 J**	**41.3**	**15.7**	**20.3**	**24.3 J**	6 UJ	6.0 UJ
Zinc	10000	NS	NS	NS	**157 J**	**11.7 J**	**111**	**17 J**	**27.6**	**328 J**	**9.7 J**	**8.7 J**
Cyanide (mg/Kg)												
Cyanide, Total	27	NS	NS	NS	0.887 U	0.625 U	0.876 U	0.608 U	0.639 U	**96 J**	0.602 U	0.604 U
Cyanide-Amenable		NS	NS	NS	0.89 U	0.62 U	0.88 U	0.61 U	0.64 U	**20.6 J**	0.6 U	0.6 U

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Location ID Sample Date Sample ID depth Interval	ST-NYSDEC Part 375-6 Restricted-Res	17SB05 4/24/2006 17SB05(25-27)042406 25-27	17SB05 4/24/2006 17SB05(27-29)042406 27-29	17SB05 4/26/2006 17SB05(35-37)042606 35-37	17SB05 4/26/2006 17SB05(37-39)042606 37-39	17SB05 4/24/2006 17SB05(49-51)042406 49-51	17SB06 5/17/2006 17SB06(27-29)051706 27-29	17SB06 5/17/2006 17SB06(29-31)051706 29-31	17SB06 5/17/2006 17SB06(35-36.5)051706 35-36.5	17SB06 5/17/2006 17SB06(36.5-37)051706 36.5-37	17SB06 5/18/2006 17SB06(50-51)051806 50-51	17WVSB02 5/12/2008 17WVSB02(20-23.5)051208 20-23.5
BTEX (mg/Kg)												
Benzene	4.8	0.029 U	**0.021 J**	0.031 U	0.035 U	0.031 U	0.029 U	0.03 U	0.03 U	0.033 U	0.028 U	**0.021 J**
Ethylbenzene	41	0.029 U	**0.026 J**	0.031 U	0.035 U	0.031 U	0.029 U	0.03 U	0.03 U	0.033 U	0.028 U	**0.240 J**
m,p-Xylene		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**0.580 J**
o-Xylene		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**0.420 J**
Toluene	100	0.029 U	**0.019 J**	0.031 U	0.035 U	0.031 U	0.029 U	0.03 U	0.03 U	0.033 U	0.028 U	**0.076**
Total Xylene (calculated)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**1.000**
Xylene (Total)	100	0.058 U	**0.149 J**	0.062 U	0.07 U	0.061 U	0.059 U	0.06 U	0.06 U	0.066 U	0.057 U	**1**
Total BTEX		0	**0.215**	0	0	0	0	0	0	0	0	**1.337**
VOC (mg/Kg)												
1,1,1-Trichloroethane	100	0.029 U	0.043 U	0.031 U	0.035 U	0.031 U	0.029 U	0.03 U	0.03 U	0.033 U	0.028 U	0.0080 U
2-Butanone (Methyl Ethyl Ketone)	100	0.15 U	**0.096 J**	0.15 U	0.17 U	0.15 U	0.15 U	0.15 U	0.15 U	0.16 U	0.14 U	**0.140 J**
Acetone	100	**0.094 J**	**0.29**	0.15 U	0.17 U	0.15 UJ	0.15 U	0.15 U	0.15 U	**0.048 J**	0.14 U	**0.510**
Carbon Disulfide		0.029 UJ	**0.018 J**	0.031 UJ	0.035 UJ	0.031 UJ	0.029 U	0.03 U	0.03 U	0.033 U	0.028 U	0.0091 U
cis-1,2-Dichloroethene	100	0.029 U	0.043 UJ	0.031 U	0.035 U	0.031 UJ	0.029 U	0.03 U	0.03 U	0.033 U	0.028 U	0.011 U
Cyclohexane		0.029 U	0.043 UJ	0.031 U	0.035 U	0.031 UJ	0.029 U	0.03 U	0.03 U	0.033 U	0.028 U	0.0086 U
Isopropylbenzene		0.029 U	**0.06**	0.031 U	0.035 U	0.031 U	0.029 U	0.03 U	0.03 U	0.033 U	0.028 U	**0.400 J**
Methylcyclohexane		0.029 U	0.043 U	0.031 U	0.035 U	0.031 U	0.029 U	0.03 U	0.03 U	0.033 U	0.028 U	0.0070 U
Methylene Chloride	100	0.029 U	0.043 UJ	0.031 U	0.035 U	0.031 UJ	0.068 UJ	0.057 U	0.074 UJ	0.057 U	0.028 UJ	0.020 U
Styrene		0.029 U	0.043 U	0.031 U	0.035 U	0.031 U	0.029 U	0.03 U	0.03 U	0.033 U	0.028 U	0.0052 U
Trichloroethene	21	0.029 U	0.043 U	0.031 U	0.035 U	0.031 U	0.029 U	0.03 U	0.03 U	0.033 U	0.028 U	0.0061 U
Total VOC		**0.094**	**0.679**	ND	ND	ND	ND	ND	ND	**0.048**	ND	**2.387**
VOC TICs (mg/kg)												
Total VOC TICs		**0.496**	**10.31**									
PAH (mg/Kg)												
2-Methylnaphthalene	NS	**0.11 J**	**0.54 J**	0.42 U	0.46 U	0.41 U	0.39 U	0.39 U	0.39 U	0.43 U	0.38 U	**2.400**
Acenaphthene	100	**0.084 J**	**0.24 J**	0.42 U	0.46 U	0.41 U	0.39 U	0.39 U	0.39 U	0.43 U	0.38 U	**0.730**
Acenaphthylene	100	0.39 U	0.58 U	0.42 U	0.46 U	0.41 U	0.39 U	0.39 U	0.39 U	0.43 U	0.38 U	**0.083 J**
Anthracene	100	**0.2 J**	**0.55 J**	0.42 U	0.46 U	0.41 U	0.39 U	0.39 U	0.39 U	0.43 U	0.38 U	**0.440 J**
Benzo(a)anthracene	1	**0.16 J**	**0.57 J**	0.42 U	0.46 U	0.41 U	0.39 U	0.39 U	0.39 U	0.43 U	0.38 U	**0.220 J**
Benzo(a)pyrene	1	**0.13 J**	**0.51 J**	0.42 U	0.46 U	0.41 U	0.39 U	0.39 U	0.39 U	0.43 U	0.38 U	**0.110 J**
Benzo(b)fluoranthene	1	**0.12 J**	**0.52 J**	0.42 UJ	0.46 U	0.41 U	0.39 U	0.39 U	0.39 U	0.43 U	0.38 U	**0.140 J**
Benzo(ghi)perylene	100	0.39 UJ	**0.17 J**	0.42 UJ	0.46 U	0.41 U	0.39 U	0.39 UJ	0.39 U	0.43 UJ	0.38 U	0.040 U
Benzo(k)fluoranthene	3.9	0.39 U	**0.32 J**	0.42 U	0.46 U	0.41 U	0.39 U	0.39 U	0.39 U	0.43 U	0.38 U	0.025 U
Chrysene	3.9	**0.15 J**	**0.62**	0.42 U	0.46 U	0.41 U	0.39 U	0.39 U	0.39 U	0.43 U	0.38 U	**0.240 J**
Dibenz(a,h)anthracene	0.33	***0.39 UJ***	***0.58 U***	***0.42 UJ***	***0.46 U***	***0.41 U***	***0.39 U***	***0.39 UJ***	***0.39 U***	***0.43 UJ***	***0.38 U***	0.040 U
Fluoranthene	100	**0.38 J**	**1**	0.42 U	0.46 U	0.41 U	**0.098 J**	0.39 U	0.39 U	0.43 U	0.38 U	**0.650**
Fluorene	100	**0.17 J**	**0.64**	0.42 U	0.46 U	0.41 U	0.39 U	0.39 U	0.39 U	0.43 U	0.38 U	**0.300 J**
Indeno(1,2,3-cd)pyrene	0.5	0.39 UJ	**0.12 J**	0.42 UJ	0.46 U	0.41 U	0.39 U	0 R	0.39 U	0 R	0.38 U	0.014 U
Naphthalene	100	**0.21 J**	**1**	0.42 U	0.46 U	0.41 U	0.39 U	0.39 U	0.39 U	0.43 U	0.38 U	**2.900**
Phenanthrene	100	**0.67**	**1.8**	0.42 U	0.46 U	0.41 U	**0.094 J**	0.39 U	0.39 U	0.43 U	0.38 U	**2.900**
Pyrene	100	**0.42**	**0.97**	0.42 U	0.46 U	0.41 U	**0.087 J**	0.39 U	0.39 U	0.43 U	0.38 U	**0.570**
Total PAH	NS	**2.804**	**9.57**	ND	ND	ND	**0.279**	ND	ND	ND	ND	**9.283**

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SVOC (mg/Kg)												
1,1-Biphenyl	NS	0.39 U	**0.12 J**	0.42 U	0.46 U	0.41 U	0.39 U	0.39 U	0.39 U	0.43 U	0.38 U	**0.081 J**
2,4-Dimethylphenol	NS	0.39 U	0.58 UJ	0.42 U	0.46 U	0.41 U	0.39 U	0.39 U	0.39 U	0.43 U	0.38 U	0.016 U
2-Methylphenol	100	0.39 U	0.58 U	0.42 U	0.46 U	0.41 U	0.39 U	0.39 U	0.39 U	0.43 U	0.38 U	0.015 U
3+4-Methylphenols	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.017 U
4-Methylphenol	100	0.39 U	0.58 U	0.42 U	0.46 U	0.41 U	0.39 U	0.39 U	0.39 U	0.43 U	0.38 U	NS
Acetophenone	NS	0.39 U	0.58 U	0.42 U	0.46 U	0.41 U	0.39 U	0.39 U	0.39 U	0.43 U	0.38 U	0.016 U
Benzaldehyde	NS	0 R	0.58 UJ	0 R	0.46 UJ	0.41 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.43 UJ	0.38 UJ	NS
bis(2-Ethylhexyl) phthalate	NS	0.39 U	**0.11 J**	0.42 U	0.46 U	0.41 U	0.39 U	0.39 U	0.39 U	0.43 U	0.38 U	0.021 U
Carbazole	NS	0.39 U	0.58 U	0.42 U	0.46 U	0.41 U	0.39 U	0.39 U	0.39 U	0.43 U	0.38 U	0.042 U
Dibenzofuran	59	**0.081 J**	**0.29 J**	0.42 U	0.46 U	0.41 U	0.39 U	0.39 U	0.39 U	0.43 U	0.38 U	0.017 U
Phenol	100	0.39 U	0.58 U	0.42 U	0.46 U	0.41 U	0.39 U	0.39 U	0.39 U	0.43 U	0.38 U	0.015 U
Total SVOC		**2.885**	**10.09**	ND	ND	ND	**0.279**	ND	ND	ND	ND	**11.764**
SVOC TICs (mg/kg)												
Total SVOC TICs		**3.68**	**11.48**	**2.67**	**3.44**	**1.62**	**2.29**	**2.25**	**2.36**	**2.73**	**2.28**	NS
Metals (mg/Kg)												
Aluminum		NS	**14100 J**	**7660 J**	NS	**5000 J**	**2760 J**	NS	**2050 J**	NS	**3330 J**	**15700**
Antimony		NS	**16.3 J**	7.61 UJ	NS	**18.1 J**	7.1 UJ	NS	7.01 UJ	NS	6.9 UJ	0.641 U
Arsenic	16	NS	**16.3 J**	**2.13**	NS	**2.1 J**	**2.07**	NS	**0.506 J**	NS	1.16 U	**8.440**
Barium	400	NS	**55.3 J**	**54.4 J**	NS	**39 J**	**20.4 J**	NS	**12.1 J**	NS	**39.5 J**	**70.8**
Beryllium	72	NS	0.88 U	0.63 U	NS	0.62 U	0.59 U	NS	0.6 U	NS	0.58 U	0.033 U
Cadmium	4.3	NS	0.88 UJ	0.63 U	NS	0.61 UJ	0.587 UJ	NS	0.584 UJ	NS	0.579 UJ	**2.200**
Calcium		NS	**3970 J**	**18300 J**	NS	**13200**	**38500 J**	NS	**1130 J**	NS	**11600 J**	**4040**
Chromium	180	NS	**27.2**	**14.9**	NS	**15.3**	**12.1 J**	NS	**6.2 J**	NS	**7.45 J**	**28.4**
Cobalt		NS	**10.5 J**	**8.36 J**	NS	**9.1 J**	**2.03 J**	NS	**1.52 J**	NS	**3.97 J**	**11.3**
Copper	270	NS	**34.9 J**	**18.7 J**	NS	**13.1 J**	**4.6 J**	NS	**4.83 J**	NS	**10.1**	**44.7**
Iron		NS	**28900 J**	**12800 J**	NS	**10800 J**	**5640 J**	NS	**4110 J**	NS	**5860 J**	**27700**
Lead	400	NS	**128**	**17.8**	NS	**8.3**	**5.99 J**	NS	**5.45**	NS	**1.87**	**219**
Magnesium		NS	**6330 J**	**7710 J**	NS	**6390 J**	**1750 J**	NS	**1150 J**	NS	**5860 J**	**6840**
Manganese	2000	NS	**991**	**704**	NS	**292**	**82.1 J**	NS	**40 J**	NS	**162 J**	**400**
Mercury	0.81	NS	**1.2 J**	**0.044 J**	NS	0.012 UJ	**0.016 J**	NS	**0.01 J**	NS	**0.012 J**	**3.5**
Nickel	310	NS	**24.4 J**	**21.4 J**	NS	**13.7 J**	**6.08 J**	NS	**5.91 J**	NS	**9.29 J**	**29.7**
Potassium		NS	**4110 J**	**3530 J**	NS	**2930 J**	**938 J**	NS	**378 J**	NS	**1820 J**	**3150**
Selenium	180	NS	**3.2 J**	1.27 UJ	NS	**1.9 J**	1.17 U	NS	1.17 U	NS	1.16 U	0.907 U
Silver	180	NS	1.8 UJ	**3.7 J**	NS	1.2 UJ	1.17 UJ	NS	1.17 UJ	NS	1.16 UJ	**1.250**
Sodium		NS	**1880 J**	**774 J**	NS	**1480 J**	**841 J**	NS	596 UJ	NS	**953 J**	**1380**
Thallium		NS	**5.3 J**	1.27 UJ	NS	1.2 U	1.17 U	NS	1.17 U	NS	1.16 U	1.090 U
Vanadium		NS	**50**	**20.2**	NS	**15.1**	**9.71 J**	NS	**7.7**	NS	**11.8**	**39.2**
Zinc	10000	NS	**89.5 J**	**45 J**	NS	**31.2 J**	**13.8 J**	NS	**10.4 J**	NS	**18.3 J**	**80.9**
Cyanide (mg/Kg)												
Cyanide, Total	27	NS	**2.17**	0.64 U	NS	0.62 U	0.59 U	NS	0.6 U	NS	0.58 U	**7.410**
Cyanide-Amenable		NS	**0.96**	0.64 U	NS	0.62 U	0.59 U	NS	0.6 U	NS	0.58 U	NS

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Intermediately Deep Soils
(below 17 ft bgs.)

Location ID Sample Date Sample ID depth Interval	ST-NYSDEC Part 375-6 Restricted-Res	17WVSB02 5/15/2008 17WVSB02(28-30)051508 28-30	ST17SB07 5/15/2008 ST17SB07(26-28)051508 26-28	ST17SB07 5/15/2008 ST17SB07(31-32)051508 31-32	ST17SB07 5/15/2008 ST17SB07(32-34)051508 32-34	ST17SB08 5/28/2008 ST17SB08(22-26)052808 22-26	ST17SB08 5/28/2008 ST17SB08(32-36)052808 32-36
BTEX (mg/Kg)							
Benzene	4.8	0.0044 U	**0.260**	0.0045 U	0.0044 U	0.0046 U	0.0043 U
Ethylbenzene	41	0.0049 U	**0.045**	0.0050 U	0.0049 U	0.0051 U	0.0048 U
m,p-Xylene		0.011 U	**0.091**	0.012 U	0.011 U	0.012 U	0.011 U
o-Xylene		0.0046 U	**0.097**	0.0047 U	0.0046 U	0.0048 U	0.0046 U
Toluene	100	0.0054 U	0.0077 U	0.0055 U	0.0054 U	0.0056 U	0.0053 U
Total Xylene (calculated)		ND	**0.188**	ND	ND	ND	ND
Xylene (Total)	100	ND	NS	ND	ND	ND	ND
Total BTEX		ND	**0.493**	ND	ND	ND	ND
VOC (mg/Kg)							
1,1,1-Trichloroethane	100	0.0058 U	0.0083 U	0.0059 U	0.0058 U	0.0060 U	0.0057 U
2-Butanone (Methyl Ethyl Ketone)	100	0.031 U	0.044 U	0.031 U	0.031 U	0.032 U	0.030 U
Acetone	100	0.100 U	0.150 U	0.110 U	0.100 U	0.110 U	0.100 U
Carbon Disulfide		0.0066 U	0.0095 U	0.0067 U	0.0066 U	0.0069 U	0.0065 U
cis-1,2-Dichloroethene	100	0.0079 U	0.011 U	0.0080 U	0.0079 U	0.0082 U	0.0078 U
Cyclohexane		0.0062 U	0.0089 U	0.0063 U	0.0062 U	0.0065 U	0.0062 U
Isopropylbenzene		0.0050 U	**0.033 J**	0.0051 U	0.0050 U	0.0052 U	0.0050 U
Methylcyclohexane		0.0051 U	0.0073 U	0.0052 U	0.0051 U	0.0053 U	0.0050 U
Methylene Chloride	100	0.015 U	**0.110 J**	0.031 U	0.031 U	0.015 U	0.015 U
Styrene		0.0038 U	0.0054 U	0.0039 U	0.0038 U	0.0039 U	0.0037 U
Trichloroethene	21	0.0045 U	0.0064 U	0.0045 U	0.0045 U	0.0046 U	0.0044 U
Total VOC		ND	**0.636**	ND	ND	ND	ND
VOC TICs (mg/kg)							
Total VOC TICs							
PAH (mg/Kg)							
2-Methylnaphthalene	NS	0.011 U	**0.580 J**	0.012 U	0.011 U	0.012 U	0.011 U
Acenaphthene	100	0.0087 U	**0.200 J**	0.0092 U	0.0088 U	0.0093 U	0.0087 U
Acenaphthylene	100	0.0059 U	**0.075 J**	0.0062 U	0.0060 U	0.0063 U	0.0059 U
Anthracene	100	**0.065 J**	**0.390 J**	0.014 U	**0.044 J**	0.014 U	0.014 U
Benzo(a)anthracene	1	**0.100 J**	**0.410 J**	0.010 U	**0.082 J**	0.010 U	0.0097 U
Benzo(a)pyrene	1	**0.087 J**	**0.440 J**	0.012 U	**0.065 J**	0.013 U	0.012 U
Benzo(b)fluoranthene	1	**0.110 J**	**0.470 J**	0.030 U	**0.087 J**	0.031 U	0.029 U
Benzo(ghi)perylene	100	0.029 U	**0.230 J**	0.031 U	0.030 U	0.031 U	0.029 U
Benzo(k)fluoranthene	3.9	**0.047 J**	**0.150 J**	0.019 U	0.019 U	0.020 U	0.018 U
Chrysene	3.9	**0.088 J**	**0.380 J**	0.0079 U	**0.063 J**	0.0080 U	0.0075 U
Dibenz(a,h)anthracene	0.33	0.030 U	**0.065 J**	0.031 U	0.030 U	0.031 U	0.030 U
Fluoranthene	100	**0.250 J**	**0.950**	0.010 U	**0.170 J**	**0.095 J**	0.0098 U
Fluorene	100	0.011 U	**0.450 J**	0.011 U	0.011 U	0.012 U	0.011 U
Indeno(1,2,3-cd)pyrene	0.5	0.010 U	**0.170 J**	0.011 U	0.010 U	0.011 U	0.010 U
Naphthalene	100	0.0097 U	**1.700**	0.010 U	0.0098 U	0.010 U	0.0097 U
Phenanthrene	100	**0.220 J**	**1.500**	**0.050 J**	**0.140 J**	**0.130 J**	0.013 U
Pyrene	100	**0.190 J**	**0.840**	0.0092 U	**0.140 J**	**0.082 J**	0.0088 U
Total PAH	NS	**1.157**	**8.420**	**0.050**	**0.791**	**0.307**	ND

Notes:
Bolded values = detected in sample
Yellow highlighted values = exceed ST-NYSDEC Part 375-6 Restricted-Residential
U = Nondetected result. The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit
J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
J+ = (Inorganics) The result is an estimated quantity, but the result may be biased high.
J- = (Inorganics) The result is an estimated quantity, but the result may be biased low.
R = The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet the quality control criteria.
The presence of absence of the analyte cannot be verified.

Table A-2
Summary of Soil Analytical Data
East 17th Street Station Site
Intermediately Deep Soils
(below 17 ft bgs.)

Location ID Sample Date Sample ID depth Interval	ST-NYSDEC Part 375-6 Restricted-Res	17WVSB02 5/15/2008 17WVSB02(28-30)051508 28-30	ST17SB07 5/15/2008 ST17SB07(26-28)051508 26-28	ST17SB07 5/15/2008 ST17SB07(31-32)051508 31-32	ST17SB07 5/15/2008 ST17SB07(32-34)051508 32-34	ST17SB08 5/28/2008 ST17SB08(22-26)052808 22-26	ST17SB08 5/28/2008 ST17SB08(32-36)052808 32-36
SVOC (mg/Kg)							
1,1-Biphenyl	NS	0.012 U	**0.098 J**	0.013 U	0.012 U	0.013 U	0.012 U
2,4-Dimethylphenol	NS	0.012 U	0.017 U	0.013 U	0.012 U	0.013 U	0.012 U
2-Methylphenol	100	0.011 U	0.015 U	0.011 U	0.011 U	0.011 U	0.011 U
3+4-Methylphenols	NS	0.012 U	**0.150 J**	0.013 U	0.012 U	0.013 U	0.012 U
4-Methylphenol	100	NS	NS	NS	NS	NS	NS
Acetophenone	NS	0.012 U	0.017 U	0.013 U	0.012 U	0.013 U	0.012 U
Benzaldehyde	NS	NS	NS	NS	NS	0.014 U	0.013 U
bis(2-Ethylhexyl) phthalate	NS	0.015 U	0.022 U	0.016 U	**0.072 J**	0.016 U	0.015 U
Carbazole	NS	0.031 U	**0.180 J**	0.032 U	0.031 U	0.033 U	0.031 U
Dibenzofuran	59	0.012 U	**0.240 J**	0.013 U	0.013 U	0.013 U	0.012 U
Phenol	100	0.011 U	0.016 U	0.012 U	0.011 U	0.012 U	0.011 U
Total SVOC		**1.157**	**9.668**	**0.050**	**0.863**	**0.307**	ND
SVOC TICs (mg/kg)							
Total SVOC TICs		NS	NS	NS	NS	NS	NS
Metals (mg/Kg)							
Aluminum		**4790**	**15200**	**2620**	**2760**	**5820**	**3370**
Antimony		0.463 U	**1.370 J**	0.496 U	0.478 U	0.504 U	0.471 U
Arsenic	16	**0.778 J**	**14.9**	0.154 U	**0.153 J**	**4.250**	**0.929**
Barium	400	**10.7**	**127**	**13.2**	**18.5**	**76.5**	**23.4**
Beryllium	72	0.024 U	**0.053 J**	**0.032 J**	**0.054 J**	0.026 U	0.024 U
Cadmium	4.3	**0.518**	**1.850**	**0.294**	**0.272**	**0.600**	**0.215 J**
Calcium		**2420**	**6390**	**1800**	**450**	**5780**	**793**
Chromium	180	**7.980**	**29.7**	**7.140**	**8.810**	**11.0**	**11.4**
Cobalt		**2.910**	**12.0**	**2.120**	**2.520**	**4.770**	**2.770**
Copper	270	**7.890**	**81.0**	**11.1**	**5.860**	**22.6**	**8.970**
Iron		**8620**	**28000**	**4570**	**4850**	**11600**	**7350**
Lead	400	**5.650**	**349**	**6.730**	**5.210**	**258 J**	**6.200 J**
Magnesium		**1840**	**6770**	**1060**	**1080**	**2810**	**1690**
Manganese	2000	**88.8**	**695**	**36.5**	**30.8**	**161**	**50.7**
Mercury	0.81	**0.010 J**	**1.6**	**0.012 J**	**0.030**	**0.493**	**0.013**
Nickel	310	**10.1**	**31.3**	**7.800**	**8.950**	**13.9**	**14.0**
Potassium		**413**	**3220**	**379**	**405**	**694 J**	**606 J**
Selenium	180	0.655 U	0.962 U	0.701 U	0.676 U	0.713 U	0.666 U
Silver	180	0.168 U	0.246 U	0.179 U	0.173 U	0.183 U	0.171 U
Sodium		**311**	**1940**	**304**	**193 J-**	**663**	**131 J**
Thallium		0.790 U	1.160 U	0.846 U	0.816 U	0.860 U	0.804 U
Vanadium		**7.060**	**37.2**	**8.890**	**11.1**	**12.6**	**11.7**
Zinc	10000	**23.6**	**134**	**13.0**	**12.5**	**56.8**	**18.0**
Cyanide (mg/Kg)							
Cyanide, Total	27	0.607 U	**3.49**	0.641 U	0.618 U	0.652 U	0.609 U
Cyanide-Amenable		NS	NS	NS	NS	NS	NS

Notes:
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The presence of absence of the analyte cannot be verified.

Appendix B

Summary of Groundwater Results

Table B-1
Summary of Groundwater Monitering Results
East 17th Street Station Site
Shallow Zone

		On-Site Locations						Off-Site Locations				
Sample Location:		**17MWS03**	**17MWS03**	**17MWS03**	**17MWS04**	**17MWS04**	**17MWS04**	**17MWS05**	**17MWS05**	**17MWS05**	**17MWS06**	**17MWS06**
Screened Interval (ft bgs):	NYSDEC AWQSGVs	7.1-17.1	7.1-17.1	7.1-17.1	7-17	7-17	7-17	7-17	7-17	7-17	5-15	5-15
Date Collected:		4/15/2004	6/7/2006	8/20/2008	4/15/2004	6/7/2006	8/20/2008	6/5/2006	9/10/2008	9/29/2008	6/5/2006	8/22/2008
Investigation Conducted By:		H&A	GEI	AECOM	H&A	GEI	AECOM	GEI	AECOM	AECOM	GEI	AECOM
BTEX (ug/L)												
Benzene	1	**53**	**79**	**14**	0.3	1 U	0.52 U	1 U	0.35 U	0.52 U	1 U	0.52 U
Toluene	5	0.3 U	0.83 J	1.3 J	0.2 U	1 U	0.51 U	1 U	0.16 U	0.51 U	1 U	0.51 U
Ethylbenzene	5	5	2.2	**49**	0.4 U	1 U	0.50 U	1 U	0.05 U	0.50 U	1 U	0.50 U
m/p-Xylenes	NE	ND	ND	24	ND	ND	0.97 U	ND	0.47 U	0.97 U	ND	0.97 U
o-Xylene	NE	ND	ND	11	ND	ND	0.51 U	ND	0.16 U	0.51 U	ND	0.51 U
Xylene, Total	5	1.8	**5.9**	**35**	0.2 U	1 U	ND	1 U	ND	ND	1 U	ND
Total BTEX	NE	59.8	87.93	99.3	0.3	ND	ND	ND	ND	ND	ND	ND
Other VOCs (ug/L)												
Chloroform	7	0.4 U	1 U	0.46 U	3.4	1 U	0.46 U	1 U	0.45 U	0.46 U	0.33 J	0.46 U
Cyclohexane	NE	NA	8.3	7.3	NA	1 U	0.37 U	1 U	0.57 U	0.37 U	1 U	0.37 U
Dichloroethene, cis-1,2-	5	0.5 U	1 U	0.53 U	0.2 U	1 U	0.53 U	1 U	0.72 U	0.53 U	1 U	0.53 U
Dichloroethene,1,1-	5	0.9 U	1 U	0.55 U	0.4 U	1 U	0.55 U	1 U	0.67 U	0.55 U	1 U	0.55 U
Isopropyl benzene	5	NA	**60**	**56**	NA	1 U	0.44 U	1 U	0.37 U	0.44 U	1 U	0.44 U
Methylcyclohexane	NE	NA	3.9	2.7	NA	1 U	0.43 U	1 U	0.47 U	0.43 U	1 U	0.43 U
Methylene chloride	5	1.6 U	1 U	0.52 U	0.8 U	1 U	0.52 U	1 U	0.38 U	0.52 U	1 U	0.52 U
Styrene	5	0.6 U	1 U	0.48 U	0.3 U	1 U	0.48 U	1 U	0.19 U	0.48 U	1 U	0.48 U
Tetrachloroethene	5	0.6 U	1 U	0.68 U	0.3 U	1 U	0.68 U	1 U	0.97 U	0.68 U	1 U	0.68 U
Trans-1,2-dichloroethene	5	0.5 U	1 U	0.57 U	0.2 U	1 U	0.57 U	1 U	0.44 U	0.57 U	1 U	0.57 U
Trichloroethene	5	0.4 U	1 U	0.56 U	0.2 U	1 U	0.56 U	1 U	0.34 U	0.56 U	1 U	0.56 U
Vinyl chloride	2	1.1 U	1 U	0.46 U	0.5 U	1 U	0.46 U	1 U	0.30 U	0.46 U	1 U	0.46 U
Total VOCs	NE	59.8	160.13	165.3	3.7	ND	ND	ND	ND	ND	0.33	ND
VOC TICs (ug/L)												
Total VOC TICs	NE	1079.6	432	NA	4	1.4	NA	4.1	NA	NA	1	NA
Noncarcinogenic PAHs (ug/L)												
Acenaphthene	20*	0.2	10 U	0.120 J	5.9	10 U	0.014 UJ	11 U	0.430 U	0.91	10 U	0.014 UJ
Acenaphthylene	NE	0.071 U	10 U	0.014 UJ	0.072 U	10 U	0.014 UJ	11 U	0.470 U	0.013 U	10 U	0.014 UJ
Anthracene	50*	0.088	10 U	0.032 J	1.5	10 U	0.044 J	11 U	1.9 U	0.041 J	10 U	0.042 J
Benzo[g,h,i]perylene	NE	ND	ND	0.009 U	ND	ND	0.009 U	ND	0.520 U	0.008 U	ND	0.032 J
Fluoranthene	50*	0.2	10 U	0.032 J	1.6	10 U	0.066 J	11 U	0.270 U	0.031 J	10 U	0.22
Fluorene	50*	0.1 U	10 U	0.110 UJ	4.9	10 U	0.110 U	11 U	0.370 U	0.32	10 U	0.110 UJ
Methylnaphthalene,2-	NE	0.5 U	10 U	0.390 U	2.5	10 U	0.420 U	11 U	0.490 U	0.380 U	10 U	0.390 U
Naphthalene	10*	9.6 J	8.1 J	**17 J**	6.4 J	10 U	0.018 UJ	11 U	0.370 U	0.64	10 U	0.017 UJ
Phenanthrene	50*	0.6	10 U	0.064 J	6.5	10 U	0.014 UJ	11 U	1.8 U	0.013 U	10 U	0.032 J
Pyrene	50*	0.2	10 U	0.032 J	1.2	10 U	0.066 J	11 U	1.9 U	0.041 J	10 U	0.15
Total Noncarcinogenic PAHs	NE	10.888	8.1	17.28	30.5	ND	0.176	ND	ND	1.983	ND	0.476
Carcinogenic PAHs (ug/L)												
Benz[a]anthracene	0.002*	0.2 U	10 U	0.013 U	**0.2**	10 U	0.013 U	11 U	1.7 U	0.012 U	10 U	0.013 UJ
Benzo[a]pyrene	NE	ND	ND	0.010 U	ND	ND	0.010 U	ND	0.290 U	0.009 U	ND	0.053 J
Benzo[b]fluoranthene	0.002*	0.2 U	10 U	0.010 U	**0.1 J**	10 U	**0.022 J**	11 U	0.570 U	0.009 U	10 U	**0.063 J**
Benzo[k]fluoranthene	0.002	NR	NR	0.015 U	NR	NR	0.015 U	NR	0.400 U	0.014 U	NR	**0.021 J**
Chrysene	0.002*	0.071 U	10 U	0.019 U	**0.2**	10 U	0.020 U	11 U	0.350 U	0.018 U	10 U	0.019 U
Total Carcinogenic PAHs	NE	ND	ND	ND	0.5	ND	0.022	ND	ND	ND	ND	0.137
Total PAHs (ug/L)												
Total PAHs	NE	10.888	8.1	17.28	31	ND	0.198	ND	ND	1.983	ND	0.613
Other SVOCs (ug/L)												
Biphenyl,1,1-	NE	NA	10 U	0.340 U	NA	10 U	0.360 U	11 U	0.430 U	0.330 U	10 U	0.340 U
Butyl benzyl phthalate	50*	0.6	10 U	0.440 U	0.4 U	10 U	0.470 U	11 U	0.560 U	0.430 U	10 U	0.450 U
Carbazole	NE	0.081 UJ	10 U	0.250 U	8.3 J	10 U	0.270 U	11 U	0.320 U	0.240 U	10 U	0.260 U
Dibenzofuran	NE	0.3 U	10 U	0.330 U	3.4	10 U	0.350 U	11 U	0.410 U	0.320 U	10 U	0.330 U
Dimethylphenol, 2,4-	50*	0.8 U	10 U	0.800 U	7	10 U	0.850 U	11 U	1.0 U	0.780 U	10 U	0.810 U
Di-n-butyl phthalate	50	0.4 U	10 U	6.2 U	0.4 U	10 U	6.6 U	11 U	7.8 U	6.0 U	10 U	6.2 U
Methylphenol,2-	NE	0.8 U	10 U	0.380 U	7.6	10 U	0.400 U	11 U	0.480 U	0.370 U	10 U	0.380 U
Methylphenol, 4-	NE	0.5 U	10 U	0.410 U	17	10 U	0.440 U	11 U	0.520 U	0.400 U	10 U	0.410 U
Phenol	NE	0.9	10 U	0.580 UJ	7.6	10 U	0.620 UJ	11 U	0.730 U	0.560 UJ	10 U	0.590 UJ
Total SVOCs	NE	12.388	8.1	17.28	81.9	ND	0.198	ND	ND	1.983	ND	0.613
SVOC TICs (ug/L)												
Total SVOC TICs	NE	1098	618.8	NA	32.2	22.1	NA	72.5	NA	NA	19.8	NA
Dissolved Metals (ug/L)												
Arsenic	25	NA	10 UJ	NA	NA	NA	NA	10 U	NA	NA	10 U	NA
Barium	1000	NA	47.3 J	NA	NA	NA	NA	200 U	NA	NA	200 U	NA
Calcium	NE	NA	177000 J	NA	NA	NA	NA	61900 J	NA	NA	111000 J	NA
Chromium	50	NA	0.65 J	NA	NA	NA	NA	10 UJ	NA	NA	10 UJ	NA
Cobalt	NE	NA	50 UJ	NA	NA	NA	NA	50 UJ	NA	NA	50 UJ	NA
Copper	200	NA	25 UJ	NA	NA	NA	NA	25 U	NA	NA	25 U	NA
Iron	300	NA	**3000**	NA	NA	NA	NA	181	NA	NA	**315**	NA
Magnesium	35000*	NA	**47800 J**	NA	NA	NA	NA	11900 J	NA	NA	33300 J	NA
Manganese	300	NA	**597 J**	NA	NA	NA	NA	130 J	NA	NA	224 J	NA
Nickel	100	NA	40 UJ	NA	NA	NA	NA	40 U	NA	NA	40 U	NA
Potassium	NE	NA	47900 J	NA	NA	NA	NA	10200	NA	NA	36500	NA
Sodium	20000	NA	**232000 J**	NA	NA	NA	NA	**38700**	NA	NA	**298000**	NA
Zinc	2000*	NA	39 J	NA	NA	NA	NA	22 UJ	NA	NA	37.7 J	NA
Total Metals (ug/L)												
Aluminum	NE	1010	285 J	78.8 J	11300	277 J	654	938 J	19.3 U	77.7 J-	200 U	72.3 J
Arsenic	25	3.2 U	10 UJ	5.400 U	9.2	10 UJ	5.400 U	10 U	5.400 U	5.400 U	14.4 J	7.000 J
Barium	1000	237	140 J	124	162	85.6 J	99.4	200 UJ	255	162	200 UJ	121
Calcium	NE	262000	163000 J	139000	166000	304000 J	363000	60900 J	84100	80900	111000 J	73500
Chromium	50	1.8 U	10 UJ	1.400 U	21.6 U	10 UJ	1.400 U	10 UJ	1.400 U	1.400 U	10 UJ	1.400 U
Cobalt	NE	1.7 U	50 UJ	2.500 U	5.3	50 UJ	2.500 U	50 UJ	2.500 U	2.500 U	50 UJ	2.500 U
Copper	200	3.7 U	3.93 J	3.700 U	26.9	25 UJ	3.900 J	25 U	3.700 U	3.700 U	25 U	3.700 U
Iron	300	**36600**	**17900**	**18700**	**13100**	**337**	**1220**	**2610**	**2060**	**3810 J**	**2590**	**1220**
Lead	25	19.6	7.59	9.900 J	**110**	5 UJ	9.220 J	**35.2**	5.570 J	17.7	14.8	8.420 J
Magnesium	35000*	**65500**	**42300 J**	33300	**48300**	**101000**	**114000**	11500	23300	12800	32700	20000
Manganese	300	**923**	**579 J**	**521**	**540**	**318 J**	**610**	159 J	**507**	279	241 J	117 J
Mercury	0.7	0.10 U	0.2 UJ	0.06 U	**0.93**	0.2 UJ	0.07 J	0.2 UJ	0.06 U	0.12 J	0.2 UJ	0.06 U
Nickel	100	2.5 U	40 UJ	4.900 U	28.5 U	40 UJ	4.900 U	40 U	4.900 U	4.900 U	40 U	4.900 U
Potassium	NE	32800	42700 J	31200	43000	108000 J	99100	9430 J	10100	12300	35900 J	23300 J
Selenium	10	4.4	10 U	4.500 U	4.2 U	10 UJ	4.500 U	10 U	4.500 U	4.890 J	10 U	4.500 U
Sodium	20000	**278000**	**203000 J**	**105000**	**208000**	**405000**	**381000**	**35800 J**	**36900**	**47700**	**294000 J**	**194000 J**
Vanadium	NE	1.8 U	50 UJ	4.100 U	24.1	50 UJ	4.100 U	50 U	4.100 U	4.100 U	50 U	4.100 U
Zinc	2000*	10.9	25.9 J	22.1	213	42.4 J	49.7	76.6 J	20.9	21.8	56.6 J	28.0 J+
Cyanide (mg/L)												
Cyanide, Amenable	NE	NA	0.01	10 U	NA	0.01	26	0.01 UJ		10 U	0.01 U	10 U
Cyanide, Total	200	0.039	0.02	13	0.085	0.078	36	0.014	10 U	10 U	0.01 U	10 U
Chloride	NE	530	NA	NA	334	NA	NA	NA	NA	NA	NA	NA
Fluoride	NE	0.1 U	NA	NA	0.1 U	NA	NA	NA	NA	NA	NA	NA
Sulfate	NE	5.0 U	NA	NA	490	NA	NA	NA	NA	NA	NA	NA
Nitrogen, Ammonia	NE	18	NA	NA	1.8	NA	NA	NA	NA	NA	NA	NA
Nitrogen, Nitrate	NE	0.1 U	NA	NA	0.14	NA	NA	NA	NA	NA	NA	NA

Notes:

Blue indicates compound detected in sample;

Red bolding indicates concentration is above the respective NYSDEC AWQSGVs.

Table Abbreviations, References and additional Notes are listed at the front of the *Chemical Data Summary Tables* group of the RI Report.

Table B-2
Summary of Groundwater Monitoring Results
East 17th Street Station Site
Intermediate Zone

		On-Site locations								Off-Site Locations			
Sample Location:	NYSDEC AWQSGVs	**17MWD03**	**17MWD03**	**17MWD03**	**17MWD04**	**17MWD04**	**17MWD04 DUP**	**17MWD04**	**17MWD04 DUP**	**17MWD05**	**17MWD05**	**17MWD06**	**17MWD06**
Screened Interval (ft bgs):		21.6-31.6	21.6-31.6	21.6-31.6	22-32	22-32	22-32	22-32	22-32	22-32	22-32	22-32	22-32
Date Collected:		4/15/2004	6/7/2006	8/20/2008	4/15/2004	6/7/2006	6/7/2006	8/20/2008	8/20/2008	6/5/2006	8/19/2008	6/5/2006	8/21/2008
Investigation Conducted By:		H&A	GEI	AECOM	H&A	GEI	GEI	AECOM	AECOM	GEI	AECOM	GEI	AECOM
BTEX (ug/L)													
Benzene	1	**46**	**1.2**	**1.6**	**2200**	1 UJ	**13 J**	**48**	**52**	**6**	**9.5**	1 U	0.52 U
Toluene	5	0.2 U	1 U	0.51 U	**810**	1 U	0.7 J	0.51 U	0.51 U	0.47 J	0.51 U	1 U	0.51 U
Ethylbenzene	5	**16**	1 U	0.50 U	**720**	1 UJ	**37 J**	0.71 J	0.76 J	0.42 J	0.50 U	1 U	0.50 U
m/p-Xylenes	NE	ND	ND	0.97 U	ND	ND	ND	0.97 U	0.97 U	ND	0.97 U	ND	0.97 U
o-Xylene	NE	ND	ND	0.71 J	ND	ND	ND	0.51 U	0.51 U	ND	0.51 U	ND	0.51 U
Xylene, Total	5	**31**	1.97 J	0.71	**1100**	4.8	4.9	ND	ND	2.21 J	ND	1 U	ND
Total BTEX	NE	93	3.17	2.31	4830	4.8	55.6	48.71	52.76	9.1	9.5	ND	ND
Other VOCs (ug/L)													
Chloroform	7	0.8	1 U	0.46 U	3.8 U	1 U	1 U	0.46 U	0.46 U	1 U	0.46 U	1 U	0.46 U
Cyclohexane	NE	NA	1.7	0.37 U	NA	0.54 J	0.58 J	0.37 U	0.37 U	1 U	0.37 U	1 U	0.37 U
Dichloroethene, cis-1,2-	5	0.2 U	1 U	0.53 U	4.8 U	1 U	1 U	2.3	2.8	**34**	**41**	0.91 J	1.8
Dichloroethene,1,1-	5	0.4 U	1 U	0.55 U	8.6 U	1 U	1 U	0.55 U	0.55 U	0.31 J	0.55 U	1 U	0.55 U
Isopropyl benzene	5	NA	4.9	**5.4**	NA	0.74 J	3.4 J	0.70 J	0.77 J	0.51 J	0.44 U	1 U	0.44 U
Methylcyclohexane	NE	NA	1 U	0.43 U	NA	0.89 J	0.81 J	0.43 U	0.43 U	1 U	0.43 U	1 U	0.43 U
Methylene chloride	5	0.8 U	1 U	0.52 U	16 U	1 U	1 U	0.52 U	0.52 U	1 U	0.52 U	1.1	0.52 U
Styrene	5	0.3 U	1 U	0.48 U	5.6 U	1 U	1	0.48 U	0.48 U	1 U	0.48 U	1 U	0.48 U
Tetrachloroethene	5	0.3 U	1 U	0.68 U	6.2 U	1 U	1 U	0.68 U	0.68 U	1.5	0.68 U	1 U	0.68 U
Trans-1,2-dichloroethene	5	0.2 U	1 U	0.57 U	5.0 U	1 U	1 U	0.88 J	0.69 J	**5.6**	**9.4**	1 U	0.57 U
Trichloroethene	5	0.2 U	1 U	0.56 U	3.6 U	1 U	1 U	0.56 U	0.56 U	**9.5**	1.8	1 U	0.56 U
Vinyl chloride	2	0.5 U	1 U	0.46 U	11 U	1 U	1 U	**3.7**	**4**	**9.9**	**24**	1 U	0.46 U
Total VOCs	NE	93.8	9.77	7.71	4830	6.97	61.39	56.29	61.02	70.42	85.7	2.01	1.8
VOC TICs (ug/L)													
Total VOC TICs	NE	548	186.2	NA	2245	140	132.7	NA	NA	23.3	NA	NA	NA
Noncarcinogenic PAHs (ug/L)													
Acenaphthene	20*	20	10 U	2.5 J	**81**	19	19	14 J	13 J	10 J	0.014 U	12 U	0.013 UJ
Acenaphthylene	NE	6.5	10 U	0.095 J	24 J	4.7 J	5 J	1.3 J	1.2 J	12 U	0.014 UJ	12 U	0.013 UJ
Anthracene	50*	3.2	10 U	0.72	22	10 U	4.3 J	3.5	3.7	2.6 J	0.013 U	12 U	0.031 J
Benzo[g,h,i]perylene	NE	ND	ND	0.008 U	ND	ND	ND	0.008 U	0.008 U	ND	0.009 U	ND	0.008 U
Fluoranthene	50*	2.3	10 U	0.48	11	4.4 J	4.4 J	6.1	6.3	1.8 J	0.520 J	12 U	0.052 J
Fluorene	50*	14	10 U	2.1 J	**66**	14	16	8.9 J	8.8 J	8.8 J	0.110 UJ	12 U	0.100 UJ
Methylnaphthalene,2-	NE	42	1.4 J	1.8 J	220 J	10 U	10 U	0.390 U	0.380 U	6.4 J	0.410 U	12 U	0.370 U
Naphthalene	10*	**130 J**	**11 J**	6.5 J	**1400**	10 U	10 U	0.550 J	0.700 J	**16**	0.017 U	12 U	0.016 UJ
Phenanthrene	50*	16	10 U	3.4	**100**	4.1 J	6.9 J	5.7	6.9	8.9 J	0.033 J	12 U	0.031 J
Pyrene	50*	2.5	10 U	0.4	7.9	3.1 J	3.1 J	3.6	3.7	12 U	0.37	12 U	0.041 J
Total Noncarcinogenic PAHs	NE	236.5	12.4	17.995	1931.9	49.3	58.7	43.65	44.3	54.5	0.923	ND	0.155
Carcinogenic PAHs (ug/L)													
Benz[a]anthracene	0.002*	**0.3**	10 U	0.013 U	1.5 U	10 U	10 U	**0.28**	**0.3**	12 U	**0.087 J**	12 U	0.012 UJ
Benzo[a]pyrene	NE	ND	ND	0.010 U	ND	ND	ND	0.020 J	0.020 J	ND	0.010 U	ND	0.009 U
Benzo[b]fluoranthene	0.002*	0.2 U	10 U	0.010 U	1.6 U	10 U	10 U	**0.041 J**	**0.041 J**	12 U	**0.033 J**	12 U	**0.031 J**
Benzo[k]fluoranthene	0.002	NR	NR	0.015 U	NR	NR	NR	0.014 U	0.014 U	NR	0.015 U	NR	**0.021 J**
Chrysene	0.002*	**0.3**	10 U	0.019 U	0.7 U	10 U	10 U	**0.23**	**0.23**	12 U	**0.054 J**	12 U	0.019 U
Total Carcinogenic PAHs	NE	0.6	ND	ND	ND	ND	ND	0.571	0.591	ND	0.174	ND	0.052
Total PAHs (ug/L)													
Total PAHs	NE	237.1	12.4	17.995	1931.9	49.3	58.7	44.221	44.891	54.5	1.097	ND	0.207
Other SVOCs (ug/L)													
Biphenyl,1,1-	NE	NA	10 U	0.340 U	NA	4.1 J	5.4 J	0.330 U	0.330 U	12 U	0.360 U	12 U	0.320 U
Butyl benzyl phthalate	50*	0.4 U	10 U	0.450 U	4.1 U	10 U	10 U	0.440 U	0.430 U	12 U	0.470 U	12 U	0.420 U
Carbazole	NE	6.7 J	10 U	0.260 U	160 J	68 J	68 J	1.9 J	1.8 J	12 U	0.270 U	12 U	0.240 U
Dibenzofuran	NE	6.4	10 U	0.330 U	71	14	16	7.7 J	8.7 J	5 J	0.340 U	12 U	0.310 U
Dimethylphenol, 2,4-	50*	0.8 U	10 U	0.810 U	**77**	10 U	10 U	0.790 U	0.780 U	12 U	0.840 U	12 U	0.770 U
Di-n-butyl phthalate	50	0.4 U	10 U	6.2 U	4.2 U	10 U	10 U	6.1 U	6.0 U	12 U	6.5 U	12 U	5.9 U
Methylphenol,2-	NE	0.8 U	10 U	0.380 U	48	10 U	10 U	0.380 U	0.370 U	12 U	0.400 U	12 U	0.360 U
Methylphenol, 4-	NE	0.5 U	10 U	0.410 U	83	10 U	10 U	0.410 U	0.400 U	12 U	0.430 U	12 U	0.390 U
Phenol	NE	0.6	10 U	0.590 UJ	42	10 U	10 U	0.570 UJ	0.570 UJ	12 U	0.610 U	12 U	0.560 U
Total SVOCs	NE	250.8	12.4	17.995	2412.9	135.4	148.1	53.821	55.391	59.5	1.097	ND	0.207
SVOC TICs (ug/L)													
Total SVOC TICs	NE	606.8	183.9	NA	7718	117	143.5	NA	NA	71.8	NA	29.7	NA
Dissolved Metals (ug/L)													
Arsenic	25	NA	10 UJ	NA	NA	NA	10 UJ	NA	NA	10 U	NA	NA	NA
Barium	1000	NA	99.1 J	NA	NA	NA	101 J	NA	NA	200 U	NA	NA	NA
Calcium	NE	NA	147000 J	NA	NA	NA	134000 J	NA	NA	68600 J	NA	NA	NA
Chromium	50	NA	3.89 J	NA	NA	NA	1.14 J	NA	NA	10 UJ	NA	NA	NA
Cobalt	NE	NA	2.32 J	NA	NA	NA	50 UJ	NA	NA	50 UJ	NA	NA	NA
Copper	200	NA	25 UJ	NA	NA	NA	25 UJ	NA	NA	25 U	NA	NA	NA
Iron	300	NA	236	NA	NA	NA	218	NA	NA	**345**	NA	NA	NA
Magnesium	35000*	NA	**150000 J**	NA	NA	NA	**107000 J**	NA	NA	**58800 J**	NA	NA	NA
Manganese	300	NA	**424 J**	NA	NA	NA	**449 J**	NA	NA	**361 J**	NA	NA	NA
Nickel	100	NA	40 UJ	NA	NA	NA	40 UJ	NA	NA	40 U	NA	NA	NA
Potassium	NE	NA	122000	NA	NA	NA	77000	NA	NA	69000 J	NA	NA	NA
Sodium	20000	NA	**354000**	NA	NA	NA	**282000**	NA	NA	**493000 J**	NA	NA	NA
Zinc	2000*	NA	36 J	NA	NA	NA	34.1 J	NA	NA	25.6 UJ	NA	NA	NA
Total Metals (ug/L)													
Aluminum	NE	237	200 U	209	132	200 U	200 U	39.3 J	19.8 J	4580 J	1740	200 U	965
Arsenic	25	15.8	16 J	8.390 J	3.2 U	10 UJ	10 UJ	5.400 U	5.400 U	12.3 J	5.400 U	10 U	5.400 U
Barium	1000	221	249 J	231	70	105 J	103 J	58.2	53.5	200 UJ	80.1	200 UJ	45.0 J
Calcium	NE	128000	148000 J	147000	98700	137000 J	135000 J	76800	71500	62800 J	63400	62000 J	49400
Chromium	50	1.6 U	10 UJ	1.400 U	1.6 U	22.5 J	12.1 J	1.520 J	1.460 J	13 J	12.8	10 U	5.37
Cobalt	NE	2.8	3.23 J	4.410 J	6.3	50 UJ	50 UJ	2.500 U	2.500 U	50 UJ	2.500 U	50 UJ	2.500 U
Copper	200	3.7 U	5.9 J	3.700 U	3.7 U	25 UJ	25 UJ	3.700 U	3.700 U	28.7 J	6.620 J	25 U	4.080 J
Iron	300	**26000**	**14500**	**19500**	**2110**	**344**	**445**	**417**	**328**	**12700**	**6910**	**1380**	**3120**
Lead	25	9.2	2.96 J	11.1	2.8	5 U	5 U	3.100 U	3.100 U	**58.1**	**36.2**	5 U	8.790 J
Magnesium	35000*	**117000**	**144000**	**122000**	**74100**	**110000**	**109000**	**53000**	**49300**	**51900 J**	**47900 J**	**44900**	33500
Manganese	300	**1400**	**456 J**	**512**	66.4	**468 J**	**462 J**	**363**	**340**	**451 J**	**344**	96.8 J	108 J
Mercury	0.7	0.10 U	0.2 UJ	0.06 U	0.10 U	0.2 UJ	0.2 UJ	0.06 U	0.06 U	0.2 UJ	0.11 J-	0.2 UJ	0.06 U
Nickel	100	1.6 U	40 UJ	4.900 U	2.3 U	4.2 J	40 UJ	4.900 U	4.900 U	40 U	11.0 J	40 U	4.900 U
Potassium	NE	65100	116000 J	86500	43100	78000 J	77400 J	37700	35200	59000 J	43400 J	66500 J	53900 J
Selenium	10	5.7	10 U	4.500 U	4.2 U	10 U	10 U	4.500 U	4.500 U	10 U	4.500 U	10 U	4.500 U
Sodium	20000	**230000**	**332000 J**	**240000**	**219000**	**292000 J**	**284000 J**	**102000**	**94100**	**404000 J**	**286000**	**279000 J**	**227000 J**
Vanadium	NE	2.7	1.62 J	4.100 U	1.8 U	50 UJ	50 UJ	4.100 U	4.100 U	50 U	5.930 J	50 U	8.220 J
Zinc	2000*	6.8	27.1 J	35.8	5.8 U	29.9 J	24.9 J	18.5 J	30.7	75.7 J	52.4	26.3 J	28.1 J+
Cyanide (mg/L)													
Cyanide, Amenable	NE	NA	0.024	24.6	NA	0.42	0.22	170	10 U	0.01 UJ	10 U	0.01 U	10 U
Cyanide, Total	200	0.16	0.025	28	4.7	0.477	0.516	**493**	**483**	0.016	10 U	0.01 U	10 U
Chloride	NE	281	NA	NA	378	NA	NA	NA	NA	NA	NA	NA	NA
Fluoride	NE	0.31	NA	NA	0.26	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	NE	62.1	NA	NA	188	NA	NA	NA	NA	NA	NA	NA	NA
Nitrogen, Ammonia	NE	195	NA	NA	10.3	NA	NA	NA	NA	NA	NA	NA	NA
Nitrogen, Nitrate	NE	0.1 U	NA	NA	0.1 U	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

Blue indicates compound detected in sample;

Red bolding indicates concentration is above the respective NYSDEC AWQSGVs

Table Abbreviations, References and additional Notes are listed at the front of the *Chemical Data Summary Tables* group of the RI Report.

Table B-3
Summary of Groundwater Monitoring Results
East 17th Street Station Site
Deep Zone

		On-Site locations				Off-Site Locations			
Sample Location:	NYSDEC AWQSGVs	**17MWDD03**	**17MWDD03**	**17MWDD04**	**17MWDD04**	**17MWDD05**	**17MWDD05**	**17MWDD06**	**17MWDD06**
Screened Interval (ft bgs):		43-53	43-53	41-51	41-51	43-51	43-51	43-51	43-51
Date Collected:		6/7/2006	8/20/2008	6/7/2006	8/20/2008	6/5/2006	8/19/2008	6/5/2006	8/22/2008
Investigation Conducted By:		GEI	AECOM	GEI	AECOM	GEI	AECOM	GEI	AECOM
BTEX (ug/L)									
Benzene	1	**3**	0.52 U	**4.7**	0.52 U	1 U	0.52 U	1 U	0.52 U
Toluene	5	1 U	0.51 U	2	0.51 U	1 U	0.51 U	1 U	0.51 U
Ethylbenzene	5	1 U	0.50 U	**6.8**	0.50 U	1 U	0.50 U	1 U	0.50 U
m/p-Xylenes	NE	ND	0.97 U	ND	0.97 U	ND	0.97 U	ND	0.97 U
o-Xylene	NE	ND	0.51 U	ND	0.51 U	ND	0.51 U	ND	0.51 U
Xylene, Total	5	1 U	ND	**10.8**	ND	1 U	ND	1 U	ND
Total BTEX	NE	3	ND	24.3	ND	ND	ND	ND	ND
Other VOCs (ug/L)									
Chloroform	7	1 U	0.46 U	1 U	0.46 U	0.37 J	0.46 U	2.4	0.46 U
Cyclohexane	NE	1 U	0.37 U	1 U	0.37 U	1 U	0.37 U	1 U	0.37 U
Dichloroethene, cis-1,2-	5	**6.9**	**17**	3.3	4	1 U	0.53 U	1 U	0.53 U
Dichloroethene,1,1-	5	1 U	0.55 U	1 U	0.55 U	1 U	0.55 U	1 U	0.55 U
Isopropyl benzene	5	1 U	0.44 U	1 U	0.44 U	1 U	0.44 U	1 U	0.44 U
Methylcyclohexane	NE	1 U	0.43 U	1 U	0.43 U	1 U	0.43 U	1 U	0.43 U
Methylene chloride	5	1 U	0.52 U	1 U	0.52 U	1 U	0.52 U	1 U	0.52 U
Styrene	5	1 U	0.48 U	1 U	0.48 U	1 U	0.48 U	1 U	0.48 U
Tetrachloroethene	5	4.5	0.68 U	2.2	2.5	1 U	0.68 U	1 U	0.68 U
Trans-1,2-dichloroethene	5	0.63 J	1.1	1 U	0.62 J	1 U	0.57 U	1 U	0.57 U
Trichloroethene	5	**6.9**	2.4	3.8	2.9	1 U	0.56 U	1 U	0.56 U
Vinyl chloride	2	1 U	1.5	1 U	0.46 U	1 U	0.46 U	1 U	0.46 U
Total VOCs	NE	21.93	22	33.6	10.02	0.37	ND	2.4	ND
VOC TICs (ug/L)									
Total VOC TICs	NE	7.3	NA	32.6	NA	NA	NA	7.8	NA
Noncarcinogenic PAHs (ug/L)									
Acenaphthene	20*	10 U	0.014 UJ	10 UJ	0.014 UJ	10 U	0.014 U	1.4 J	0.230 J
Acenaphthylene	NE	10 U	0.014 UJ	10 UJ	0.014 UJ	10 U	0.014 UJ	1.4 J	0.042 J
Anthracene	50*	10 U	0.013 U	10 UJ	0.062 J	10 U	0.013 U	10 U	0.56
Benzo[g,h,i]perylene	NE	ND	0.009 U	ND	0.008 U	ND	0.009 U	ND	0.008 U
Fluoranthene	50*	10 U	0.032 J	10 UJ	0.59	10 U	0.540 J	1.3 J	1.3
Fluorene	50*	10 U	0.110 UJ	10 UJ	0.100 UJ	10 U	0.110 UJ	2.7 J	0.100 UJ
Methylnaphthalene,2-	NE	10 U	0.400 U	10 UJ	0.390 U	10 U	0.410 U	1.8 J	0.380 U
Naphthalene	10*	10 U	0.017 UJ	10 UJ	0.017 UJ	10 U	0.018 U	7.9 J	0.017 UJ
Phenanthrene	50*	10 U	0.014 U	10 UJ	0.042 J	1.8 J	0.033 J	6 J	0.031 J
Pyrene	50*	10 U	0.032 J	10 UJ	0.39	10 U	0.37	10 U	0.78
Total Noncarcinogenic PAHs	NE	ND	0.064	ND	1.084	1.8	0.943	22.5	2.943
Carcinogenic PAHs (ug/L)									
Benz[a]anthracene	0.002*	10 U	0.013 U	10 UJ	0.012 U	10 U	**0.077 J**	10 U	0.012 UJ
Benzo[a]pyrene	NE	ND	0.010 U	ND	0.009 U	ND	0.022 J	ND	0.009 U
Benzo[b]fluoranthene	0.002*	10 U	0.010 U	10 UJ	**0.021 J**	10 U	**0.033 J**	10 U	0.009 U
Benzo[k]fluoranthene	0.002	NR	0.015 U	NR	0.015 U	NR	0.015 U	NR	0.015 U
Chrysene	0.002*	10 U	0.019 U	10 UJ	0.019 U	10 U	**0.055 J**	10 U	0.019 U
Total Carcinogenic PAHs	NE	ND	ND	ND	0.021	ND	0.187	ND	ND
Total PAHs (ug/L)									
Total PAHs	NE	ND	0.064	ND	1.105	1.8	1.13	22.5	2.943
Other SVOCs (ug/L)									
Biphenyl,1,1-	NE	10 U	0.350 U	10 UJ	0.330 U	10 U	0.350 U	10 U	0.330 U
Butyl benzyl phthalate	50*	10 U	0.460 U	10 UJ	0.440 U	10 U	0.460 U	3.7 J	0.430 U
Carbazole	NE	10 U	0.260 U	10 UJ	0.250 U	10 U	0.260 U	10 U	0.250 U
Dibenzofuran	NE	10 U	0.340 U	10 UJ	0.320 U	10 U	0.340 U	1.8 J	0.320 U
Dimethylphenol, 2,4-	50*	10 U	0.830 U	10 UJ	0.790 UJ	10 U	0.840 U	10 U	0.780 U
Di-n-butyl phthalate	50	10 U	6.4 U	10 UJ	6.1 U	10 U	6.4 U	4.1 J	6.0 U
Methylphenol,2-	NE	10 U	0.390 U	10 UJ	0.380 UJ	10 U	0.400 U	10 U	0.370 U
Methylphenol, 4-	NE	10 U	0.420 U	10 UJ	0.410 UJ	10 U	0.430 U	2.6 J	0.400 U
Phenol	NE	10 U	0.600 UJ	10 UJ	0.570 UJ	10 U	0.600 U	1.6 J	0.570 U
Total SVOCs	NE	ND	0.064	ND	1.105	1.8	1.13	36.3	2.943
SVOC TICs (ug/L)									
Total SVOC TICs	NE	43.1	NA	132.9	NA	20.6	NA	21	NA
Dissolved Metals (ug/L)									
Arsenic	25	10 UJ	NA	10 UJ	NA	NA	NA	10 U	NA
Barium	1000	42.4 J	NA	82.4 J	NA	NA	NA	200 U	NA
Calcium	NE	84900 J	NA	113000 J	NA	NA	NA	286000 J	NA
Chromium	50	10 UJ	NA	0.91 J	NA	NA	NA	10 UJ	NA
Cobalt	NE	50 UJ	NA	50 UJ	NA	NA	NA	50 UJ	NA
Copper	200	7.49 J	NA	25 UJ	NA	NA	NA	25 U	NA
Iron	300	**442**	NA	206	NA	NA	NA	98.1 J	NA
Magnesium	35000*	**48800 J**	NA	**42600 J**	NA	NA	NA	**322000 J**	NA
Manganese	300	**461 J**	NA	**1710 J**	NA	NA	NA	**460 J**	NA
Nickel	100	5.54 J	NA	40 UJ	NA	NA	NA	40 U	NA
Potassium	NE	37300	NA	27600	NA	NA	NA	142000 J	NA
Sodium	20000	**149000**	NA	**68800**	NA	NA	NA	**3750000**	NA
Zinc	2000*	37.8 J	NA	42.3 J	NA	NA	NA	24.1 UJ	NA
Total Metals (ug/L)									
Aluminum	NE	521 J	1450	200 U	541	200 U	61.3 J	411 J	407
Arsenic	25	10 UJ	5.400 U	10 UJ	5.400 U	10 U	5.400 U	10 U	5.400 U
Barium	1000	43.9 J	51.7	87.3 J	67.3	200 UJ	61.9	200 UJ	93.3
Calcium	NE	84000 J	96700	118000 J	118000	75200 J	76600	259000 J	353000
Chromium	50	17.3 J	1.840 J	10 UJ	1.400 U	10 UJ	1.400 U	10 UJ	1.400 U
Cobalt	NE	50 UJ	2.500 U	50 UJ	2.500 U	50 UJ	2.500 U	50 UJ	2.500 U
Copper	200	25 UJ	3.700 U	25 UJ	3.700 U	25 U	3.700 U	25 U	3.700 U
Iron	300	**878**	**3380**	**506**	**1180**	**958**	**1530**	**2070**	**5000**
Lead	25	5 U	4.160 J	5 U	7.350 J	5 U	7.230 J	5 U	3.100 U
Magnesium	35000*	**49000**	**49400**	**44800**	**42700**	**69500**	**72600 J**	**288000 J**	**427000**
Manganese	300	**486 J**	**580**	**1830 J**	**1790**	261 J	255	**427 J**	**542 J**
Mercury	0.7	0.2 UJ	0.06 U	0.2 UJ	0.06 U	0.2 UJ	0.06 UJ	0.2 UJ	0.06 U
Nickel	100	9.46 J	5.380 J	1.89 J	4.950 J	40 U	4.900 U	40 U	4.900 U
Potassium	NE	37000 J	29100	29500 J	24600	76400 J	61300 J	128000 J	119000 J
Selenium	10	10 U	4.500 U	10 U	4.500 U	10 U	4.500 U	10 U	4.500 U
Sodium	20000	**148000 J**	**109000**	**72700 J**	**62600**	**1970000 J**	**1550000 J**	**3590000 J**	**2690000**
Vanadium	NE	50 UJ	4.100 U	50 UJ	4.100 U	50 U	4.100 U	50 U	4.100 U
Zinc	2000*	31.7 J	40.5	29.9 J	58.5	22.8 J	46.2	40.2 J	4.200 U
Cyanide (mg/L)									
Cyanide, Amenable	NE	0.01 U	10 U	0.01 UJ	10 U	0.01 U	10 U	0.01 U	10 U
Cyanide, Total	200	0.01 U	10 U	0.018	10 U	0.01 U	10 U	0.01 U	10 U
Chloride	NE	NA	NA	NA	NA	NA	NA	NA	NA
Fluoride	NE	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	NE	NA	NA	NA	NA	NA	NA	NA	NA
Nitrogen, Ammonia	NE	NA	NA	NA	NA	NA	NA	NA	NA
Nitrogen, Nitrate	NE	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

Blue indicates compound detected in sample;

Red bolding indicates concentration is above the respective NYSDEC AWQSGVs

Table Abbreviations, References and additional Notes are listed at the front of the *Chemical Data Summary Tables* group of the RI Report.

Appendix C

Summary of Indoor Air/Soil Gas Results

Table C-1
East 17th Street Station Air and Soil Gas Analytical Results Summary
Stuyvesant Town Interim Remedial Investigation Report
New York, NY

Sample ID: Sample Type: Date Collected: Investigation Conducted by:	***NYSDOH Indoor Air Upper Fence (95th percentile)***	***NYSDOH Indoor Air Upper Quartile (75th percentile)***	**STY-IA-1E17 CRAWL** Indoor Air 01/29/2003 RETEC	**STY-IA-1FDE17 CRAWL** Indoor Air 01/29/2003 RETEC	**STY-IA-2E17 CRAWL** Indoor Air 01/29/2003 RETEC	**STY-SV01** Soil Gas 03/16/2006 **GEI**	**STY-SV02** Soil Gas 03/16/2006 **GEI**	**STY-SV03** Soil Gas 03/16/2006 **GEI**	**STY-SV04** Soil Gas 03/16/2006 **GEI**	**STY-SV05** Soil Gas 04/06/2006 **GEI**	**STY-SV06** Soil Gas 05/09/2006 **GEI**	**SG-1E-17** Soil Gas 08/20/2003 RETEC
BTEX (ug/m3)												
Benzene	13	5.9	**3.3**	**3.1**	**3.7**	**191.4**	**5.4**	**15.3**	**16**	**5.7**	**10.8**	**14**
Ethylbenzene	6.4	2.8	**1.1**	**1.2**	**1.7**	**7.8**	3.6 U	**6.9**	**10**	**8.2**	3.9 U	**77**
Toluene	57	24.8	**6.5**	**6.5**	**8.4**	**26**	**4.1**	**98**	**41.5**	**37.7**	**8.7**	**220**
Xylene, o-	7.1	3.1	**1.5**	**1.7**	**2.6**	**5.2**	3.6 U	**6.5**	**10.4**	**7.8**	3.9 U	**120**
Xylenes, m,p	11	4.6	**3.6**	**4.6**	**6.9**	**9.1**	3.6 U	**16.1**	**22.1**	**19.5**	3.9 U	**300**
Other VOCs (ug/m3)												
2,2,4-Trimethylpentane	5	2.1	ND	ND	ND	**27.6**	3.9 U	**14.9**	**6.1**	4.3 U	4.2 U	**30**
Acetone	115	52	**56**	**10**	**45**	8.3 U	8.1 U	**11.4**	**85.7**	**9.5**	**59.5**	**190**
Allyl chloride	NE	NE	NA	NA	NA	11 U	10.6 U	9.4 U	11.3 U	11.6 U	11.3 U	NA
Benzyl chloride	NE	NE	ND	ND	ND	4.6 U	4.4 U	3.8 U	4.7 U	4.8 U	4.7 U	ND
Bromodichloromethane	NE	NE	ND	ND	ND	5.9 U	5.6 U	5 U	6 U	**10.7**	6 U	ND
Bromoform	NE	NE	ND	ND	ND	9.1 U	8.7 U	7.7 U	9.3 U	9.5 U	9.3 U	ND
Bromomethane	0.48	<0.25	ND	ND	ND	3.4 U	3.3 U	2.9 U	3.5 U	3.6 U	3.5 U	ND
Butadiene, 1,3-	NE	NE	**5.1**	**4.8**	ND	1.9 U	1.9 U	1.6 U	2 U	2 U	2 U	ND
Butanone,2-	16	7.3	**3.6**	ND	**7.1**	2.6 U	2.5 U	2.2 U	**26.3**	**6.2**	**13.3**	**12**
Carbon disulfide	NE	NE	ND	ND	ND	**59.1**	**3.7**	**28.3**	**239.5**	**65.3**	**23.3**	ND
Carbon tetrachloride	1.3	0.59	ND	ND	ND	5.5 U	5.3 U	4.7 U	5.7 U	5.8 U	5.7 U	ND
Chlorobenzene	0.41	<0.25	ND	ND	ND	4.1 U	3.9 U	3.4 U	4.1 U	4.2 U	4.1 U	ND
Chloroethane	0.39	<0.25	ND	ND	ND	2.3 U	2.2 U	2 U	2.4 U	2.4 U	2.4 U	ND
Chloroform	1.2	0.54	**2.1**	**2**	**1.3**	**21.5**	4.1 U	3.6 U	**10.2**	**165.9**	**7.8**	ND
Chloromethane	4.2	1.8	**1.5**	**1.4**	**4.4**	7.2 U	7 U	6.2 U	7.5 U	7.7 U	7.5 U	**1.3**
Cryofluorane	0.42	<0.25	ND	ND	ND	6.2 U	5.9 U	5.2 U	6.3 U	6.4 U	6.3 U	ND
Cyclohexane	6.3	2.6	ND	ND	ND	**25.5**	2.9 U	**26.8**	**4.5**	3.2 U	**4.8**	**26**
Dibromochloromethane	NE	NE	ND	ND	ND	7.5 U	7.1 U	6.3 U	7.6 U	7.8 U	7.6 U	ND
Dibromoethane,1,2-	0.38	<0.25	ND	ND	ND	6.8 U	6.5 U	5.7 U	6.9 U	7.1 U	6.9 U	ND
Dichlorobenzene,1,2-	0.48	<0.25	ND	ND	ND	5.3 U	5 U	4.4 U	5.4 U	5.5 U	5.4 U	ND
Dichlorobenzene,1,3-	0.46	<0.25	ND	ND	ND	5.3 U	5 U	4.4 U	5.4 U	5.5 U	5.4 U	ND
Dichlorobenzene,1,4-	1.2	0.54	ND	ND	**86**	5.3 U	5 U	4.4 U	5.4 U	5.5 U	5.4 U	**19**
Dichlorodifluoromethane	10	4.1	**9.2**	**9.6**	**29**	**4.4**	4.2 U	**4.2**	4.5 U	4.6 U	4.5 U	**3.4**
Dichloroethane,1,1-	0.38	<0.25	ND	ND	ND	3.6 U	3.4 U	3 U	3.6 U	3.7 U	3.6 U	ND
Dichloroethane,1,2-	0.37	<0.25	ND	ND	ND	3.6 U	3.4 U	3 U	3.6 U	3.7 U	3.6 U	ND
Dichloroethene, cis-1,2-	0.41	<0.25	ND	ND	ND	3.5 U	3.3 U	2.9 U	3.6 U	3.7 U	3.6 U	ND
Dichloroethene,1,1-	0.4	<0.25	ND	ND	ND	3.5 U	3.3 U	2.9 U	3.6 U	3.7 U	3.6 U	ND
Dichloropropane,1,2-	0.39	<0.25	ND	ND	ND	4.1 U	3.9 U	3.4 U	4.2 U	4.3 U	4.2 U	ND
Dichloropropene, cis-1,3	0.38	<0.25	ND	ND	ND	4 U	3.8 U	3.4 U	4.1 U	4.2 U	4.1 U	ND
Dichloropropene, trans-1,3	0.4	<0.25	ND	ND	ND	4 UJ	3.8 UJ	3.4 UJ	4.1 UJ	4.2 U	4.1 U	ND
Dioxane,1,4-	NE	NE	ND	ND	ND	12.6 U	12.2 U	10.8 U	13 U	13.3 U	13 U	ND
Ethanol	1300	540	**38**	**44**	**1100**	6.6 U	6.4 U	**9.8**	6.8 U	7 U	**13**	**39**
Ethyltoluene, p-	NE	NE	ND	ND	ND	4.3 U	4.1 U	3.6 U	**25.1**	**7.9**	4.4 U	**100**
Heptane, n-	18	7.6	ND	ND	ND	**33.6**	3.4 U	**22.5**	**10.2**	**4.5**	**11.1**	**20**
Hexachlorobutadiene	0.49	<0.25	ND	ND	ND	37.3 U	36.2 U	32 U	38.4 U	39.4 U	38.4 U	ND
Hexane, n-	14	6	ND	ND	ND	**77.7**	3 U	**35.3**	**16.2**	**6**	**22.9**	**12**
Hexanone,2-	NE	NE	ND	ND	ND	14.3 U	13.9 U	12.3 U	**16.4**	15.2 U	14.8 U	ND
Isopropyl benzene	0.82	0.39	NA	NA	NA	4.3 U	4.1 U	3.6 U	**6.9**	4.5 U	4.4 U	NA
Methyl tert-butyl ether	14	5.6	ND	ND	ND	3.2 U	3 U	**13.7**	3.2 U	**4.7**	3.2 U	**380**
Methyl-2-pentanone,4-	1.9	0.86	ND	ND	ND	3.6 U	3.4 U	3 U	**4.9**	3.8 U	3.7 U	ND
Methylene chloride	16	6.6	**1.4**	**1.6**	**1.4**	3.1 U	2.9 U	2.6 U	3.1 U	3.2 U	3.1 U	**3**
Naphthalene	NE	NE	ND	ND	**5**	18.3 U	17.8 U	15.7 U	18.9 U	19.4 U	18.9 U	**39**
Propanol,2-	NE	NE	**4.6**	**7.4**	**30**	8.6 U	8.4 U	**8.1**	8.9 U	9.1 U	8.9 U	**9.5**
Propene	NE	NE	ND	ND	ND	NA	NA	NA	NA	NA	NA	ND
Propylbenzene, n-	1.5	0.69	NA	NA	NA	4.3 U	4.1 U	3.6 U	4.4 U	4.5 U	4.4 U	NA
Styrene	1.4	0.64	ND	ND	ND	3.7 U	3.6 U	3.2 U	**4.7**	3.9 U	3.8 U	ND
Tetrachloroethane,1,1,2,2-	0.38	<0.25	ND	ND	ND	6 U	5.8 U	5.1 U	6.2 U	6.3 U	6.2 U	ND
Tetrachloroethene	2.5	1.1	**1.7**	**1.7**	**1.5**	**115.3**	**12.2**	**176.3**	**155.9**	**311.9**	**21.7**	**2.4**
Tetrahydrofuran	0.78	0.35	ND	ND	ND	2.6 U	2.5 U	2.2 U	2.7 U	2.7 U	2.7 U	ND
Trans-1,2-dichloroethene	NE	NE	ND	ND	ND	3.5 U	3.3 U	2.9 U	3.6 U	3.7 U	3.6 U	ND
Trichloro-1,2,2-trifluoroethane,1,1,2	2.5	1.1	ND	ND	ND	6.7 U	6.4 U	5.7 U	6.9 U	7.1 U	6.9 U	ND
Trichlorobenzene,1,2,4-	0.47	<0.25	ND	ND	ND	26 U	25.2 U	22.3 U	26.7 U	27.5 U	26.7 U	ND
Trichloroethane,1,1,1-	2.5	1.1	ND	ND	ND	4.8 U	4.6 U	4 U	4.9 U	5 U	4.9 U	ND
Trichloroethane,1,1,2-	0.38	<0.25	ND	ND	ND	4.8 U	4.6 U	4 U	4.9 U	5 U	4.9 U	ND
Trichloroethene	0.46	<0.25	ND	**2.4**	ND	4.7 U	4.5 U	4 U	4.8 U	4.9 U	**7.5**	ND
Trichlorofluoromethane	12	5.4	**2.1**	**2.4**	**5.4**	4.9 U	4.7 U	4.2 U	5.1 U	**9.6**	5.1 U	ND
Trimethylbenzene,1,2,4-	9.8	4.3	**1.2**	**2.5**	**4.4**	**4.8**	4.1 U	**4.5**	**42.3**	**14.8**	4.4 U	**120**
Trimethylbenzene,1,3,5-	3.9	1.7	ND	**0.88**	**1.2**	4.3 U	4.1 U	3.6 U	**10.8**	4.5 U	4.4 U	**32**
Vinyl Acetate	NE	NE	ND	ND	ND	NA	NA	NA	NA	NA	NA	ND
Vinyl chloride	0.37	<0.25	ND	ND	ND	2.3 U	2.2 U	1.9 U	2.3 U	2.4 U	2.3 U	ND
VOC TICs (ug/m3)												
2,3-Dimethylpentane	5.2	2.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	**69**
2-METHYL BUTANE	NE	NE	**9.2**	**8.9**	**11**	**141.6 NJ**	**13 NJ**	**241.9 NJ**	**29.5 NJ**	ND	**35.4 NJ**	**23**
2-Methylpentane	NE	NE	ND	**3.4**	**3.8**	**133.8 NJ**	**21.1 NJ**	**98.6 NJ**	ND	ND	ND	**12**
INDANE	NE	NE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
INDENE	NE	NE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thiophene	NE	NE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Bolding indicates compound detected in sample; gray shading indicates indoor air concentration above respective NYSDOH Upper Quartile (90th percentile) value from referenced Indoor Air study. Table Abbreviations, References and additional Notes are listed at the front of the *Chemical Data Summary Tables* group of the RI Report.

Table C-2
Indoor Air Sample Results
East 17th Station Sites
February 2009

Sample Location	CAS No.	*Former East 17th Street Station*				
		16 South Oval St.			NYSDOH Background Indoor Air Values[1]	
Type of Sample		Crawlspace		Stairwell		
Sample ID		IA1E17	IAIFDE17	IA2E17		
Sampling Date		2/26/2009	2/26/2009	2/26/2009	75th Percentile	90th Percentile
Compound (µg/m³)						
Benzene	71-43-2	**1.1**	**1.1**	**3.0**	5.9	15
Toluene	108-88-3	**2.9**	**2.9**	**10**	24.8	58
Ethylbenzene	100-41-4	**0.67 U**	**0.69 U**	**1.0**	2.8	7.4
m/p-Xylenes	136777-61-2	**1.2**	**1.2**	**3.7**	4.6	12
o-Xylene	95-47-6	**0.67 U**	**0.69 U**	**1.2**	3.1	7.6
Naphthalene	91-20-3	4.1 U	4.1 U	4.2 U	NL	NL
Indane	496-11-7	3.7 U	3.8 U	3.9 U	NL	NL
Indene	95-13-6	3.7 U	3.8 U	3.8 U	NL	NL
Thiophene	110-02-1	2.7 U	2.7 U	2.8 U	NL	NL
1,2,4-Trimethylbenzene	95-63-6	**0.76 U**	**0.78 U**	**0.79 U**	4.3	9.5
1,3,5-Trimethylbenzene	108-67-8	0.76 U	0.78 U	0.79 U	1.7	3.6
2,2,4-Trimethylpentane	540-84-1	3.6 U	3.7 U	3.8 U	NL	NL
2,3-Dimethylpentane	565-59-3	3.2 U	3.2 U	3.3 U	2.2	7.5
2-Methylpentane	107-83-5	2.7 U	2.8 U	3.1	NL	NL
4-Ethyltoluene	622-96-8	3.8 U	3.9 U	4.0 U	NL	NL
Carbon Disulfide	75-15-0	2.4 U	2.5 U	2.5 U	NL	NL
Cyclohexane	110-82-7	2.7 U	2.7 U	2.8 U	2.6	8.1
Heptane	142-82-5	3.2 U	3.2 U	3.3 U	7.6	19
Hexane	110-54-3	2.7 U	2.8 U	6.3	6	18
Isopentane	78-784	**5.7**	**5.6**	**5.8**	NL	NL
Styrene	100-42-5	0.66 U	0.67 U	0.68 U	0.64	1.3
1,1,1-Trichloroethane (1,1,1-TCA)	71-55-6	0.84 U	0.86 U	1.8	1.1	3.1
1,1,2,2-Tetrachloroethane	79-34-5	1.1 U	1.1 U	1.1 U	<0.25	<0.25
1,1,2-Trichloroethane	79-00-5	0.84 U	0.86 U	0.88 U	<0.25	<0.25
1,1-Dichloroethane	75-34-3	0.63 U	0.64 U	0.65 U	<0.25	<0.25
1,1-Dichloroethene	75-35-4	0.61 U	0.63 U	0.64 U	<0.25	<0.25
1,2,4-Trichlorobenzene	120-82-1	5.8 U	5.9 U	6.0 U	<0.25	3.4
1,2-Dibromoethane (EDB)	106-93-4	1.2 U	1.2 U	1.2 U	<0.25	<0.25
1,2-Dichlorobenzene	95-50-1	0.93 U	0.95 U	0.97 U	<0.25	0.72
1,2-Dichloroethane	107-06-2	0.63 U	0.64 U	0.65 U	<0.25	<0.25
1,2-Dichloropropane	78-87-5	0.72 U	0.73 U	0.74 U	<0.25	<0.25
1,3-Butadiene	106-99-0	1.7 U	1.7 U	1.8 U	NL	NL
1.3-Dichlorobenzene	541-73-1	0.93 U	0.95 U	0.97 U	<0.25	0.6
1,4-Dichlorobenzene	106-46-7	0.93 U	0.95 U	17	0.54	1.3
1,4-Dioxane	123-91-1	2.8 U	2.8 U	2.9 U	NL	NL
2-Butanone (MEK)	78-93-3	2.7	2.3 U	11	7.3	16
2-Hexanone	591-78-6	3.2 U	3.2 U	3.3 U	NL	NL
4-Methyl-2-pentanone	108-10-1	3.2 U	3.2 U	3.3 U	0.86	2.2
Acetone	67-64-1	**10**	**6.1**	**39**	52	110
Benzyl chloride	100-44-7	0.80 U	0.82 U	0.83 U	NL	NL
Bromodichloromethane	75-27-4	5.2 U	5.3 U	5.4 U	NL	NL
Bromoform	75-25-2	8.0 U	8.2 U	8.3 U	NL	NL
Bromomethane	74-83-9	0.60 U	0.61 U	0.62 U	<0.25	0.6
Carbon Tetrachloride	56-23-5	0.98 U	0.99 U	1.0 U	0.59	0.81
Chlorobenzene	108-90-7	0.71 U	0.73 U	0.74 U	<0.25	<0.25
Chloroethane	75-00-3	0.41 U	0.42 U	0.42 U	<0.25	<0.25
Chloroform	67-66-3	**0.76 U**	**0.77 U**	**5.7**	0.54	1.4
Chloromethane	74-87-3	**0.97**	**1.3**	**2.6**	1.8	3.3
cis-1,2-Dichloroethene	156-59-2	0.61 U	0.63 U	0.64 U	<0.25	<0.25
cis-1,3-Dichloropropene	10061-01-5	0.70 U	0.72 U	0.73 U	<0.25	<0.25
Dibromochloromethane	124-48-1	6.6 U	6.7 U	6.8 U	NL	NL
Ethanol	64-17-5	**7.1**	**7.1**	**68**	540	1400
Trichlorofluoromethane (Freon 11)	75-69-4	**1.5**	**1.7**	**1.6**	5.4	17
1,1,2-Trichlorotrifluoroethane (Freon 113)	76-13-1	1.2 U	1.2 U	1.2 U	1.1	1.8
1,2-Dichlorotetrafluoroethane	76-14-2	1.1 U	1.1 U	1.1 U	<0.25	0.52
Dichlorodifluoromethane (Freon 12)	75-71-8	**3.3**	**3.3**	**3.3**	4.1	15
Hexachlorobutadiene (C-46)	87-68-3	8.3 U	8.4 U	8.6 U	<0.25	4.6
Methyl tert-Butyl Ether (MTBE)	1634-04-4	2.8 U	2.8 U	2.9 U	5.6	27
Methylene Chloride (Dichloromethane)	75-09-2	0.54 U	0.55 U	0.56 U	6.6	22
2-Propanol	67-63-0	6.9	6.4	860 E	NL	NL
Propene	115-07-1	1.3 U	1.4 U	1.4 U	NL	NL
Tetrachloroethene (PCE)	127-18-4	1.0 U	1.1 U	1.6	1.1	2.9
Tetrahydrofuran	109-99-9	2.3 U	2.3 U	2.4 U	0.35	3.3
Trans-1,2-Dichloroethene	156-60-5	3.1 U	3.1 U	3.2 U	NA	NA
Trans-1,3-Dichloropropene	10061-02-6	0.70 U	0.72 U	0.73 U	<0.25	<0.25
Trichloroethene (TCE)	79-01-6	0.83 U	0.85 U	0.86 U	<0.25	0.48
Vinyl Chloride	75-01-4	0.40 U	0.40 U	0.41 U	<0.25	<0.25

Notes:
All units in micrograms per cubic meter (µg/m³)
1 - New York State Department of Health, November 14, 2005.
Bold - Compound detected in a concentration greater than the method reporting limits.
Exceeds NYSDOH Background Indoor Air Values 90th Percentile
Dup - As suffix on Sample ID indicates that the sample is a field duplicate.
E - Exceeded calibration range.
NL - Not listed - data not available for background concentrations for these compounds.
U - The compound was analyzed for, but was not detected above the method reporting limit.
R - The data are unusable. The sample results are rejected due to serious deficiencies in the ability to meet quality control criteria. The presence or absence of the analyte cannot be verified
N - The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification.
NJ - The analysis indicates the presence of an analyte that has been tentatively identified and the associated numerical value represents appropriate concentration
J - The analyte was positively identified. The associated numerical value is the approximate concentration of the analyte in the sample.
UJ - The analyte was analyzed for, but was not detected. The reported quantitation limit is approximated and may be UJ - inaccurate or imprecise.

Table C-3
Indoor Air Sample Results
East 17th Street Station Site
January 2010

Sample Location	CAS No.	16 South Oval			NYSDOH Background Indoor Air Values[3]	
Type of Sample		Indoor Air	Indoor Air	Indoor Air		
Sample ID		IA1E17	IA1FDE17	IA2E17	75th Percentile	90th Percentile
Laboratory ID		1001301-08A	1001301-09A	1001301-10A		
Sampling Date		1/15/2010	1/15/2010	1/15/2010		
Compound (µg/m³)						
Possibly MGP Related or Other Sources [1]						
1,2,4-Trimethylbenzene	95-63-6	1.1 U	0.75 U	**0.95**	4.3	9.5
1,3,5-Trimethylbenzene	108-67-8	1.1 U	0.75 U	0.82 U	1.7	3.6
2,2,4-Trimethylpentane	540-84-1	5.1 U	3.6 U	3.9 U	NL	NL
2,3-Dimethylpentane	565-59-3	4.4 U	3.1 U	3.4 U	2.2	7.5
2-Methylpentane	107-83-5	3.8 U	2.7 U	3.0 U	NL	NL
4-Ethyltoluene	622-96-8	5.3 U	3.7 U	4.1 U	NL	NL
Benzene	71-43-2	**1.8 J**	0.48 UJ	**4.5**	5.9	15
Carbon Disulfide	75-15-0	3.4 U	2.4 U	2.6 U	NL	NL
Cyclohexane	110-82-7	3.7 U	2.6 U	2.9 U	2.6	8.1
Ethylbenzene	100-41-4	0.94 U	0.66 U	**1.2**	2.8	7.4
Heptane	142-82-5	4.4 U	3.1 U	3.4 U	7.6	19
Hexane	110-54-3	3.8 U	2.7 U	3.0 U	6	18
Indan	496-11-7	5.2 U	3.7 U	4.1 U	NL	NL
Indene	95-13-6	5.2 U	3.6 U	4.0 U	NL	NL
Isopentane	78-784	**7.8 J**	**3.0 J**	**8.6**	NL	NL
Naphthalene	91-20-3	5.7 U	4.0 U	4.4 U	NL	NL
Styrene	100-42-5	0.92 U	0.65 U	0.72 U	0.64	1.3
Thiophene	110-02-1	3.7 U	2.6 U	2.9 U	NL	NL
Toluene	108-88-3	**8.3 J**	0.57 UJ	**11**	24.8	58
m/p-Xylenes	136777-61-2	**1.8 J**	0.66 UJ	**3.6**	4.6	12
o-Xylene	95-47-6	0.94 U	0.66 U	**1.1**	3.1	7.6
Not MGP Related [2]						
1,1,1-Trichloroethane (1,1,1-TCA)	71-55-6	1.2 UJ	**1.2 J**	**2.2**	1.1	3.1
1,1,2,2-Tetrachloroethane	79-34-5	1.5 U	1.0 U	1.2 U	<0.25	<0.25
1,1,2-Trichloroethane	79-00-5	1.2 U	0.83 U	0.92 U	<0.25	<0.25
1,1-Dichloroethane	75-34-3	0.88 U	0.62 U	0.68 U	<0.25	<0.25
1,1-Dichloroethene	75-35-4	0.86 U	0.60 U	0.67 U	<0.25	<0.25
1,2,4-Trichlorobenzene	120-82-1	8.0 U	5.6 U	6.2 U	<0.25	3.4
1,2-Dibromoethane (EDB)	106-93-4	1.7 U	1.2 U	1.3 U	<0.25	<0.25
1,2-Dichlorobenzene	95-50-1	1.3 U	0.91 U	1.0 U	<0.25	0.72
1,2-Dichloroethane	107-06-2	0.88 U	0.62 U	0.68 U	<0.25	<0.25
1,2-Dichloropropane	78-87-5	1.0 U	0.70 U	0.78 U	<0.25	<0.25
1,3-Butadiene	106-99-0	2.4 U	1.7 U	**2.6**	NL	NL
1.3-Dichlorobenzene	541-73-1	1.3 U	0.91 U	1.0 U	<0.25	0.6
1,4-Dichlorobenzene	106-46-7	**1.9 J**	0.91 UJ	**26**	0.54	1.3
1,4-Dioxane	123-91-1	3.9 U	2.7 U	3.0 U	NL	NL
2-Butanone (MEK)	78-93-3	3.2 U	2.2 U	**5.2**	7.3	16
2-Hexanone	591-78-6	4.4 U	3.1 U	3.4 U	NL	NL
4-Methyl-2-pentanone	108-10-1	4.4 U	3.1 U	3.4 U	0.86	2.2
Acetone	67-64-1	**13 J**	**7.7 J**	**42**	52	110
Benzyl chloride	100-44-7	1.1 U	0.79 U	0.87 U	NL	NL
Bromodichloromethane	75-27-4	7.3 U	5.1 U	5.6 U	NL	NL
Bromoform	75-25-2	11 U	7.8 U	8.7 U	NL	NL
Bromomethane	74-83-9	**0.95 J**	**0.78 J**	**0.81 J**	<0.25	0.6
Carbon Tetrachloride	56-23-5	1.4 U	0.96 U	1.0 U	0.59	0.81
Chlorobenzene	108-90-7	1.0 U	0.70 U	0.77 U	<0.25	<0.25
Chloroethane	75-00-3	0.57 U	0.40 U	0.44 U	<0.25	<0.25
Chloroform	67-66-3	1.0 U	0.74 U	**4.4**	0.54	1.4
Chloromethane	74-87-3	**1.0**	**1.0**	**3.8**	1.8	3.3
cis-1,2-Dichloroethene	156-59-2	0.86 UJ	**1.1 J**	0.67 U	<0.25	<0.25
cis-1,3-Dichloropropene	10061-01-5	0.98 U	0.69 U	0.76 U	<0.25	<0.25
Dibromochloromethane	124-48-1	9.2 U	6.5 U	7.2 U	NL	NL
Ethanol	64-17-5	**26 J**	**14 J**	**160 J**	540	1400
Trichlorofluoromethane (Freon 11)	75-69-4	**1.5**	**1.2**	**1.8**	5.4	17
1,1,2-Trichlorotrifluoroethane (Freon 113)	76-13-1	1.7 U	1.2 U	1.3 U	1.1	1.8
1,2-Dichlorotetrafluoroethane	76-14-2	1.5 U	1.1 U	1.2 U	<0.25	0.52
Dichlorodifluoromethane (Freon 12)	75-71-8	**1.9**	**2.0**	**2.0**	4.1	15
Hexachlorobutadiene (C-46)	87-68-3	12 U	8.1 U	9.0 U	<0.25	4.6
Methyl tert-Butyl Ether (MTBE)	1634-04-4	3.9 U	2.7 U	3.0 U	5.6	27
Methylene Chloride (Dichloromethane)	75-09-2	0.75 UJ	**1.1 J**	**1.4 J**	6.6	22
2-Propanol	67-63-0	**5.7 J**	1.9 UJ	**54**	NL	NL
Propene	115-07-1	1.9 U	1.3 U	1.4 U	NL	NL
Tetrachloroethene (PCE)	127-18-4	1.5 U	1.0 U	**2.6**	1.1	2.9
Tetrahydrofuran	109-99-9	3.2 U	2.2 U	2.5 U	0.35	3.3
Trans-1,2-Dichloroethene	156-60-5	4.3 U	3.0 U	3.3 U	NA	NA
Trans-1,3-Dichloropropene	10061-02-6	0.98 U	0.69 U	0.76 U	<0.25	<0.25
Trichloroethene (TCE)	79-01-6	1.2 U	0.82 U	0.90 U	<0.25	0.48
Vinyl Chloride	75-01-4	0.55 U	0.39 U	0.43 U	<0.25	<0.25

Notes:

All units in micrograms per cubic meter (µg/m³)

1 - These compounds may be related to either MGP sources or non-MGP sources, or both. MGP sources include MGP tars and petroleum feedstocks used in MGP processes, such as the carburetted water gas process. Non-MGP sources include cleaning products, floor wax and polish, vehicle exhaust, construction materials, and cigarette smoke.

2 - These compounds are not related to MGP sources and are present due to non-MGP sources, such as vehicle exhaust, heating and air conditioning systems, cleaning agents, art supplies, paints, etc.

3 - New York State Department of Health, November 14, 2005.

Bold - Compound detected in a concentration greater than the method reporting limits.

Exceeds NYSDOH Bakground Indoor Air Values 90th Percentile

Dup - As suffix on Sample ID indicates that the sample is a field duplicate.

NL - Not listed - data not available for background concentrations for these compounds.

U - The compound was analyzed for, but was not detected above the method reporting limit.

R - The data are unusable. The sample results are rejected due to serious deficiencies in the ability to meet quality control criteria. The presence or absence of the analyte cannot be verified.

N - The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification.

NJ - The analysis indicates the presence of an analyte that has been tentatively identified and the associated numerical value represents its approximate concentration.

J - The analyte was positively identified. The associated numerical value is the approximate concentration of the analyte in the sample.

UJ - The analyte was analyzed for, but was not detected. The reported quantitation limit is approximated and may be UJ - inaccurate or imprecise.

Appendix D

Summary of Cost Estimates for Alternatives

Table D-1

Project Name:	17th Street Station	**Revision No.:**	0
Cost Estimate No.:	Alternative 3 Institutional Controls and Soil Removal	**Date:**	4/29/10
Client	Con-Ed	**Status:**	Draft
Location	NYC, NY	**Author:**	CCD
		Office:	WES
Project Element:	AAR	**Reviewed By:**	
Type of Estimate:	Feasibility/Conceptual		

Project Details

Project Location:	
Project Start Date:	
Project Duration:	
Type of Contract:	Direct Owner
Level of Accuracy:	*-30% to +50%*
Contingency:	20%

Scope Summary

Summarize scope of work and provide project specific details with reference to source

Document Source: _____ **Rev. Date:** _____ **Site Visit?** _____
Document Source: _____ **Rev. Date:** _____
Document Source: _____ **Rev. Date:** _____

Cost Summary

Prime Contractor Costs	$	555,732	$	880,000		
Other Contracts & Purchases	$	124,800				
Design Costs	$	201,280				
30 Year O&M NPV						
				-30%	+50%	
Project Total Estimated Cost	$	880,000	$	1,000,000	$	1,000,000

Notes:
1. Note intended use and audience
2. List major project assumptions
3. Accuracy ranges are based on information provided in "Association for Advancement of Cost Engineering (AACE), International Cost Estimating Classifications, 18R-97"

Estimate Type	*Accuracy Range*
Preliminary	*-50% to +100%*
Feasibility/Conceptual	*-30% to +50%*
Engineering	
30%	*-20% to +30%*
60%	*-15% to +20%*
90%	*-10% to +15%*

4. Contingency values are based on information provided in 'USEPA, Guide to Developing Cost Estimates, July 2000

Remediation Technology	*Scope Contingency*
Soil Excavation	*15% to 55%*
Groundwater Treatment (Multiple	*15% to 35%*
On-site Incineration	*15% to 35%*
Extraction Wells	*10% to 30%*
Vertical Barriers	*10% to 30%*
Synthetic Cap	*10% to 20%*
Off-site Disposal	*5% to 15%*
Off-site Incineration	*5% to 15%*
Bulk Liquid Processing	*5% to 15%*
Clay Cap	*5% to 10%*
Surface Grading/Diking	*5% to 10%*
Revegetation	*5% to 10%*

5. Values and costs are for informational purposes only. Values are not true costs because they represent a combination of fixed capital and quantity-proportional components

17th Street Station
Alternative 3 Institutional Controls and Soil Removal
Con-Ed
NYC, NY

AAR

By: CCD Rev Date: 4/29/2010

Prime Contractor Costs					0%	20%			
Task ID	Task Descr.	Unit	Quantity	Bare Cost	MU	Contingency	Total Cost	Unit Rate	%
1	Mobilization	LS	1	$300,000	$0	$60,000	$360,000	$360,000	65%
2	Excavation	CY	1,066	$143,110	$0	$28,622	$171,732	$161	31%
3	Excavation Shoring	MO	1	$20,000	$0	$4,000	$24,000	$24,000	4%
				$463,110	$0	$92,622	$555,732		100%
Other Contracts & Purchases					10%	20%			
Task ID	Task Descr.	Unit	Quantity	Bare Cost	MU	Contingency	Total Cost	Unit Rate	%
1	Waste Disposal	TON	640	$96,000	$9,600	$19,200	$124,800	$195	100%
				$96,000	$9,600	$19,200	$124,800		100%
Design Costs					0%	20%			
Task ID	Task Descr.	Unit	Quantity	Bare Cost	MU	Contingency	Total Cost	Unit Rate	%
1	Construction Oversight and Air Monitorir	LS	1	$111,822	$0	$22,364	$134,186	$134,186	67%
2	Engineering Design	LS	1	$55,911	$0	$11,182	$67,093	$67,093	33%
				$167,733	$0	$33,547	$201,280		100%
Grand Total							$881,811		

17th Street Station
Alternative 3 Institutional Controls and Soil Removal
Con-Ed
NYC, NY
14th Street Station
AAR

Add Task | Delete Row | Add 1 Blank Row | By: CCD | Rev Date: 4/29/10

Task/Sub Task	Description	Unit		Qty	Rate	Total Cost	
Prime Contractor Costs		NOTE- All costs include contractor Overhead and Profit					
1	**Mobilization**	**LS**		**1**		**$300,000.00**	
	Mobilization	LS		1	100000	$100,000.00	
	Site Preparation and Temporary Facilities	LS		1	200000	$200,000.00	
						$0.00	
2	**Excavation**	**CY**		**1066**		**$143,109.80**	
	Excavation	CY		1066	87	$92,742.00	
	Clean Fill Material	CY		480	13.5	$6,480.00	
	Place and Compact	CY		1279.2	9	$11,512.80	
	Compaction Testing	EA		3	125	$375.00	
	Landscaping and Restoration	SF		3200.0	10	$32,000.00	
						$0.00	
3	**Excavation Shoring**	**MO**		**1**		**$20,000.00**	
	Modular shoring (Trench Boxes)	MO		1	20000	$20,000.00	
		0	0	0	0	$0.00	
	SUB-TOTAL CONTRACTOR					**$463,109.80**	**$463,109.80**
	Mark-up		0%				**$0.00**
	Contingency		20%				**$92,621.96**
	Total Subcontractor						**$555,731.76**
Other Contracts & Purchases							
1	**Waste Disposal**	**TON**		**640**		**$96,000.00**	
	Transportation and Disposal (RCRA - C Non-Haz)	TON		640	150	$96,000.00	
		0	0	0	0	$0.00	
	SUB-TOTAL OTHER CONTRACTS					**$96,000.00**	**$96,000.00**
	Mark-up		10%				**$9,600.00**
	Contingency		20%				**$19,200.00**
	Total Subcontractor						**$124,800.00**
Design Costs							
1	**Construction Oversight and Air Monitoring**	**LS**		**1**		**$111,821.96**	
	Construction Oversight and Air Monitoring	LS		1	$111,821.96	$111,821.96	
						$0.00	
2	**Engineering Design**	**LS**		**1**		**$55,910.98**	
	Engineering Design	LS		1	$55,910.98	$55,910.98	
						$0.00	
	SUB-TOTAL Design COSTS					**$167,732.94**	**$167,732.94**
	Mark-up		0%				**$0.00**
	Contingency		20%				**$33,546.59**
	Total Design						**$201,279.53**
	GRAND TOTAL						**$881,811.29**

Table D-2

Project Name:	17th Street Station	**Revision No.:**	0
Cost Estimate No.:	Alternative 4 Institutional Controls, Soil Removal and Source Material Control	**Date:**	4/29/10
Client	Con-Ed	**Status:**	Draft
Location	NYC, NY	**Author:**	CCD
		Office:	WES
Project Element:	AAR	**Reviewed By:**	
Type of Estimate:	Feasibility/Conceptual		

Project Details

Project Location:	
Project Start Date:	
Project Duration:	
Type of Contract:	Direct Owner
Level of Accuracy:	*-30% to +50%*
Contingency:	20%

Scope Summary

Summarize scope of work and provide project specific details with reference to source

Document Source: _____ **Rev. Date:** _____ **Site Visit?** _____
Document Source: _____ **Rev. Date:** _____
Document Source: _____ **Rev. Date:** _____

Cost Summary

Prime Contractor Costs	$	2,949,732				
Other Contracts & Purchases	$	1,163,136				
Design Costs	$	1,207,019				
30 Year O&M NPV						
			-30%		+50%	
Project Total Estimated Cost	$	5,320,000	$	4,000,000	$	8,000,000

Notes:
1. Note intended use and audience
2. List major project assumptions
3. Accuracy ranges are based on information provided in "Association for Advancement of Cost Engineering (AACE), International Cost Estimating Classifications, 18R-97"

Estimate Type	*Accuracy Range*
Preliminary	*-50% to +100%*
Feasibility/Conceptual	*-30% to +50%*
Engineering	
30%	*-20% to +30%*
60%	*-15% to +20%*
90%	*-10% to +15%*

4. Contingency values are based on information provided in 'USEPA, Guide to Developing Cost Estimates, July 2000

Remediation Technology	*Scope Contingency*
Soil Excavation	*15% to 55%*
Groundwater Treatment (Multipl	*15% to 35%*
On-site Incineration	*15% to 35%*
Extraction Wells	*10% to 30%*
Vertical Barriers	*10% to 30%*
Synthetic Cap	*10% to 20%*
Off-site Disposal	*5% to 15%*
Off-site Incineration	*5% to 15%*
Bulk Liquid Processing	*5% to 15%*
Clay Cap	*5% to 10%*
Surface Grading/Diking	*5% to 10%*
Revegetation	*5% to 10%*

5. Values and costs are for informational purposes only. Values are not true costs because they represent a combination of fixed capital and quantity-proportional components

17th Street Station
Alternative 4 Institutional Controls, Soil Removal and Source Material Control
Con-Ed
NYC, NY

AAR

By: CCD Rev Date: 4/29/2010

Prime Contractor Costs					0%	20%			
Task ID	Task Descr.	Unit	Quantity	Bare Cost	MU	Contingency	Total Cost	Unit Rate	%
1	Mobilization	LS	1	$300,000	$0	$60,000	$360,000	$360,000	12%
2	Excavation	CY	1,066	$143,110	$0	$28,622	$171,732	$161	6%
3	Excavation Shoring	MO	1	$20,000	$0	$4,000	$24,000	$24,000	1%
4	In-Situ Solidification	CY	5,700	$1,995,000	$0	$399,000	$2,394,000	$420	81%
				$2,458,110	$0	$491,622	$2,949,732		100%
Other Contracts & Purchases					10%	20%			
Task ID	Task Descr.	Unit	Quantity	Bare Cost	MU	Contingency	Total Cost	Unit Rate	%
1	Waste Disposal	TON	5,965	$894,720	$89,472	$178,944	$1,163,136	$195	100%
				$894,720	$89,472	$178,944	$1,163,136		100%
Design Costs					0%	20%			
Task ID	Task Descr.	Unit	Quantity	Bare Cost	MU	Contingency	Total Cost	Unit Rate	%
1	Construction Oversight and Air Monitorir	LS	1	$670,566	$0	$134,113	$804,679	$804,679	67%
2	Engineering Design	LS	1	$335,283	$0	$67,057	$402,340	$402,340	33%
				$1,005,849	$0	$201,170	$1,207,019		100%
Grand Total							#REF!		

17th Street Station
Alternative 4 Institutional Controls, Soil Removal and Source Material Control
Con-Ed
NYC, NY
14th Street Station
AAR

Add Task | Delete Row | Add 1 Blank Row | By: CCD | Rev Date: 4/29/10

Task/Sub Task	Description	Unit		Qty	Rate	Total Cost	
Prime Contractor Costs		NOTE- All costs include contractor Overhead and Profit					
1	**Mobilization**	**LS**		**1**		**$300,000.00**	
	Mobilization	LS		1	100000	$100,000.00	
	Site Preparation and Temporary Facilities	LS		1	200000	$200,000.00	
						$0.00	
2	**Excavation**	**CY**		**1066**		**$143,109.80**	
	Excavation	CY		1066	87	$92,742.00	
	Clean Fill Material	CY		480	13.5	$6,480.00	
	Place and Compact	CY		1279.2	9	$11,512.80	
	Compaction Testing	EA		3	125	$375.00	
	Landscaping and Restoration	SF		3200.0	10	$32,000.00	
						$0.00	
3	**Excavation Shoring**	**MO**		**1**		**$20,000.00**	
	Modular shoring (Trench Boxes)	MO		1	20000	$20,000.00	
		0	0	0	0	$0.00	
4	**In-Situ Solidification**	**CY**		**5700**		**$1,995,000.00**	
	Mobilization	LS		1	300000	$300,000.00	
	Solidification	CY		5300	300	$1,590,000.00	
	Barrier Wall Solidification	CY		300	350	$105,000.00	
	SUB-TOTAL CONTRACTOR					**$2,458,109.80**	**$2,458,109.80**
	Mark-up		0%				**$0.00**
	Contingency		20%				**$491,621.96**
	Total Subcontractor						**$2,949,731.76**
Other Contracts & Purchases							
1	**Waste Disposal**	**TON**		**5964.8**		**$894,720.00**	
	Transportation and Disposal (RCRA - C Non-Haz)	TON		5964.8	150	$894,720.00	
		0	0	0	0	$0.00	
	SUB-TOTAL OTHER CONTRACTS					**$894,720.00**	**$894,720.00**
	Mark-up		10%				**$89,472.00**
	Contingency		20%				**$178,944.00**
	Total Subcontractor						**$1,163,136.00**
Design Costs							
1	**Construction Oversight and Air Monitoring**	**LS**		**1**		**$670,565.96**	
	Construction Oversight and Air Monitoring	LS		1	$670,565.96	$670,565.96	
						$0.00	
2	**Engineering Design**	**LS**		**1**		**$335,282.98**	
	Engineering Design	LS		1	$335,282.98	$335,282.98	
						$0.00	
	SUB-TOTAL Design COSTS					**$1,005,848.94**	**$1,005,848.94**
	Mark-up		0%				**$0.00**
	Contingency		20%				**$201,169.79**
	Total Design						**$1,207,018.73**
	GRAND TOTAL						**$5,319,886.49**